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Computers & The CEO

Management consultant Mary E. Boone, author of *Leadership and the Computer*: "Executives focus too much on saying, 'Computers aren't for me. They're for my secretaries and clerks,' because they simply have no idea of what a computer can do."

Story starts on page 58

INTEL'S 486SX: THE PERFECT CHIP FOR NETWORK SERVERS?

Wayne A. Yacco: "The i486SX is not only well suited to service as a network server, its low cost could make it the best chip Intel has for the job."

Page 36

MACINTOSH: SYSTEM 7 TIPS FROM BMUG

Page 198

KANJITALK

Page 94

WORDPERFECT 2.0

Page 124

US Sprint CEO William Esrey: "I need to be fully aware of how the organization is functioning. Information systems help me to create a firm foundation."

Page 70

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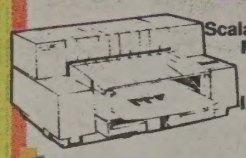

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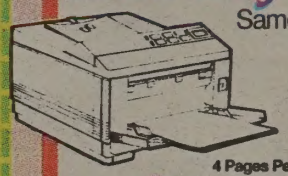

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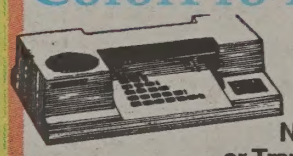

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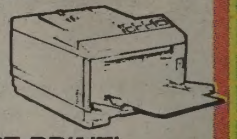

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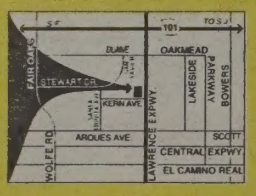

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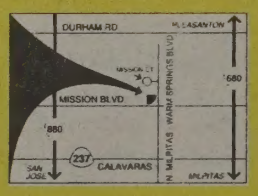

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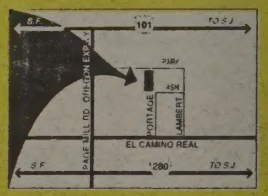

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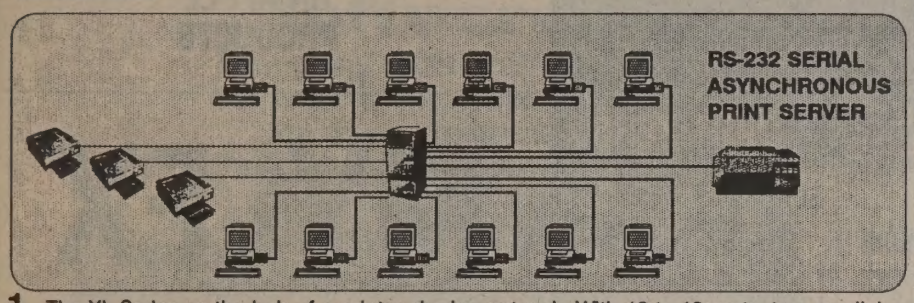

1. The XL-Series as the hub of a printer sharing network. With 10 to 18 ports, two parallel connectors and RJ12 twisted pair connectors for the remainder, this configuration allows you to create a stand-alone network and add stations as required.

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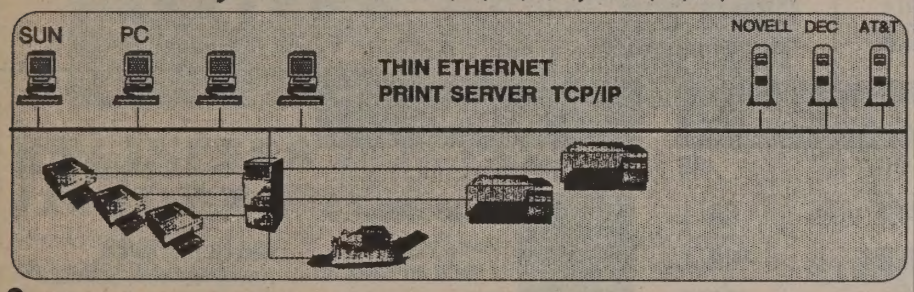

2. The XL-Series as an Ethernet TCP/IP print server. Connect the unit as one of the nodes on your network and link-up to any one of 10 to 18 printers.

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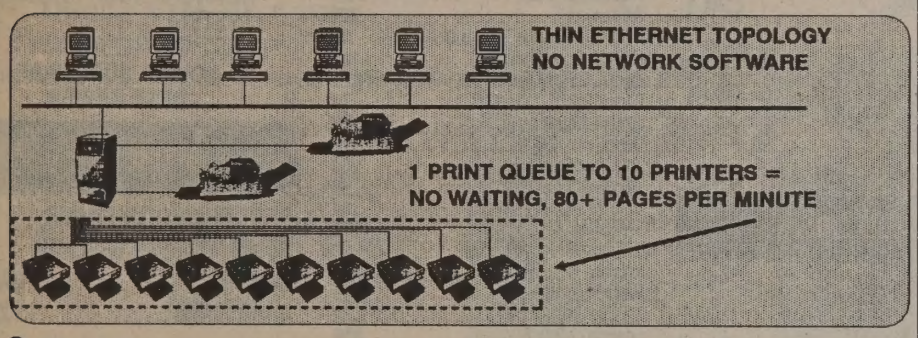

3. The XL-Series as a print server or peripheral sharing hub - using thin Etherent cables, but without network software. Ten printers in a class yield 80 pages per minute output - no queues and no waiting.

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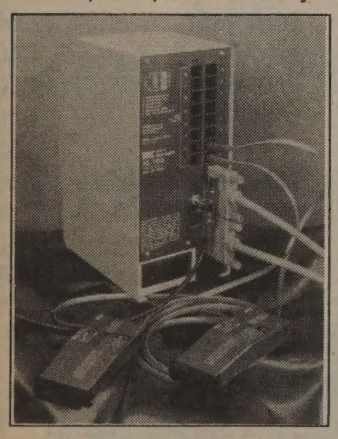

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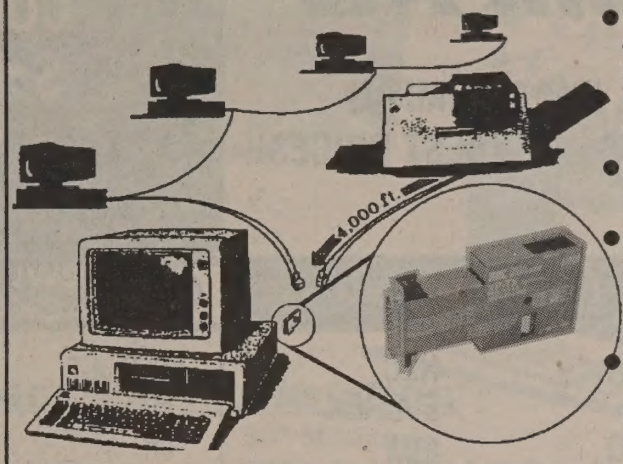

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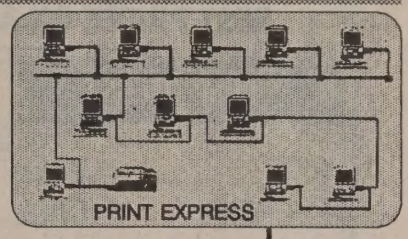

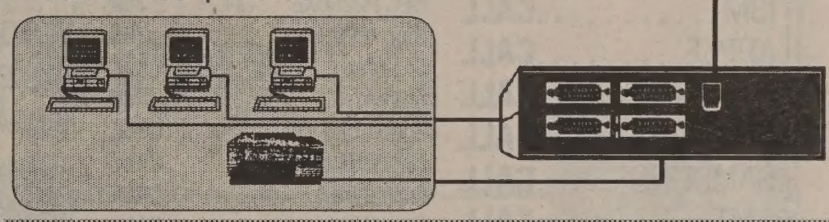

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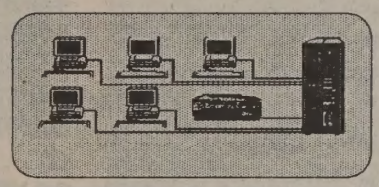

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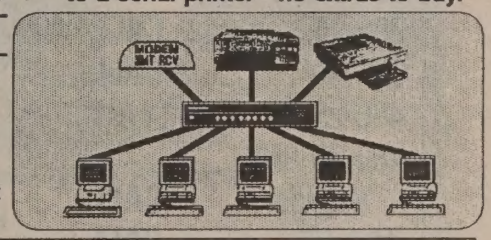

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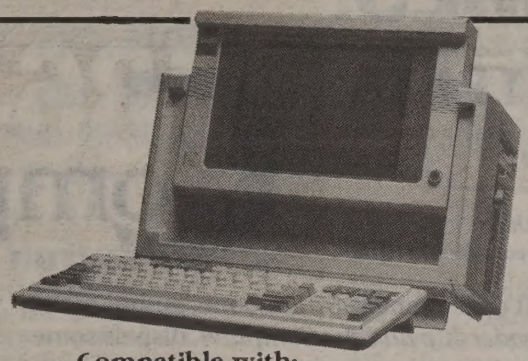

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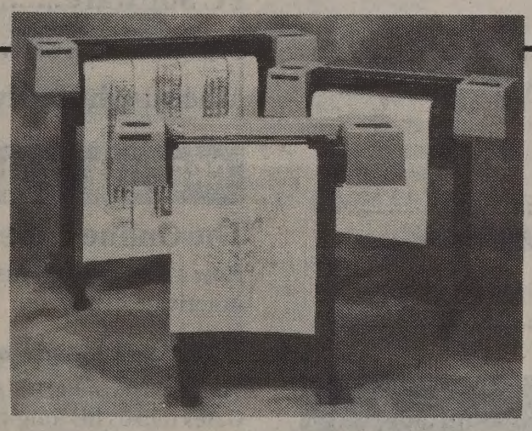

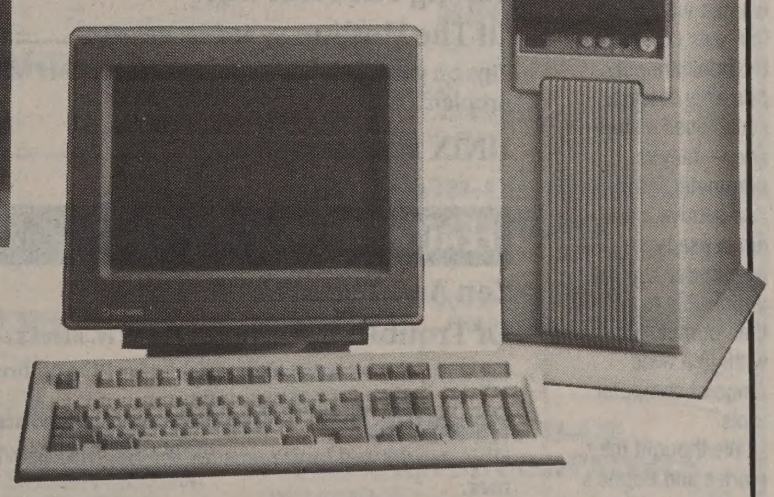

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No doubt about it, computers have revolutionized the way business is done, from the international mega-corporation to the home office.

Somewhat surprisingly, though, in many cases senior executives—even while vigorously promoting techno-tools to their subordinates—are often the last ones to put the computer to use themselves.

So when, a few weeks ago, we received an advance copy of Mary E. Boone's *Leadership and the Computer*, we were intrigued not only by its premise—case histories of corporate CEOs who use the computer as an integral part of their job—but by its practical orientation. The men and women whose case histories comprise the book are not, primarily at least, starry-eyed visionaries—they're pragmatic, competitive, no-nonsense types who find it impossible to run their companies without a wide range of computer tools.

We thought their stories and Boone's perspective offered some unique insights into real-world solutions, and we hope you agree.

—ME

58 Computers & The CEO

By Mary Eisenhart

Cover and contents photos: NDMA Inc., US Sprint

Management consultant Mary E. Boone, author of the new book *Leadership and the Computer*, dispels some myths and explains why computers are an important tool in the executive office and not just in the MIS department. Also, in an excerpt from her book, she tells the case history of William Esrey, CEO of US Sprint, and how his personal use of computers gave the fledgling company a competitive edge.

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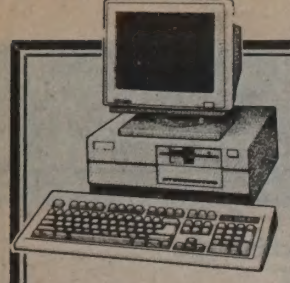

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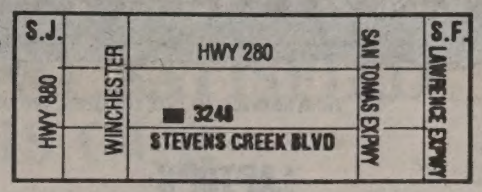

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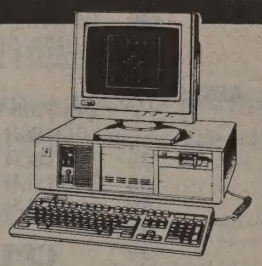

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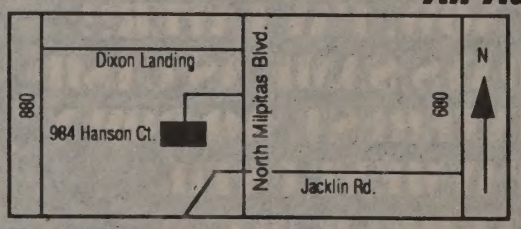

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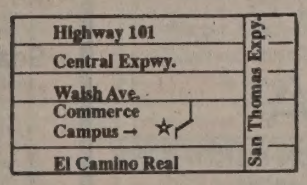

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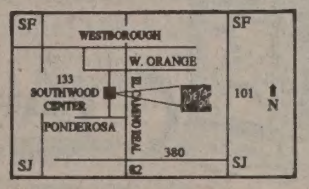

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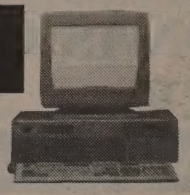

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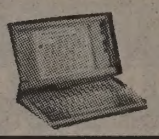

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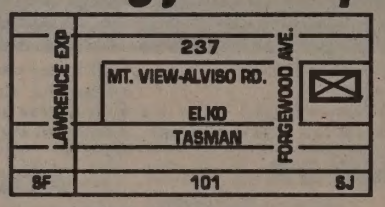

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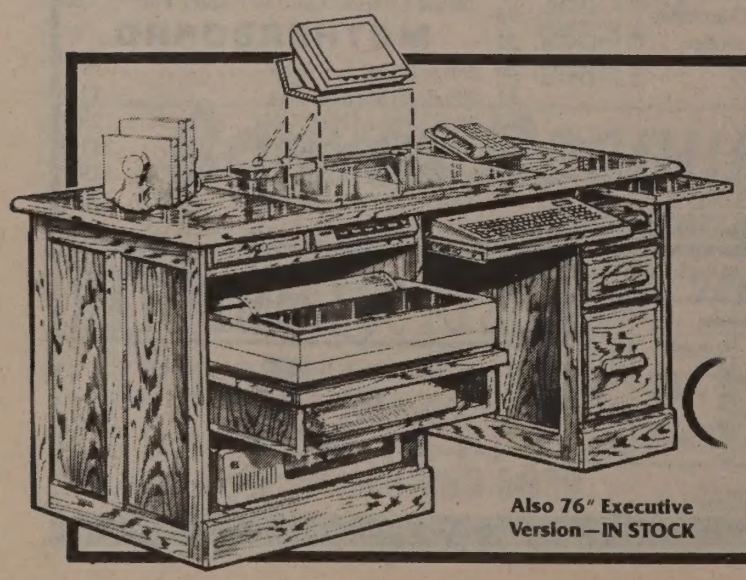

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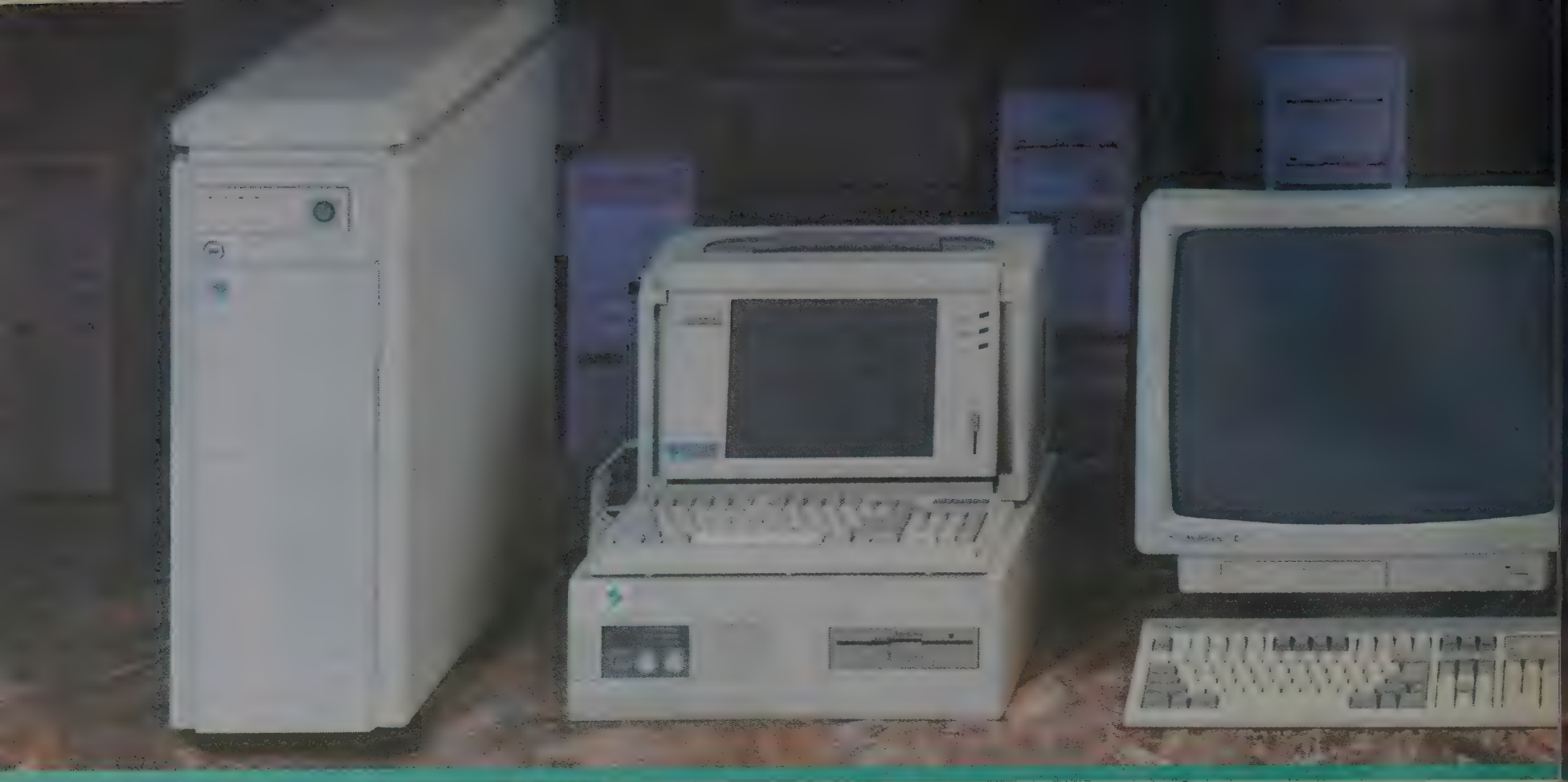

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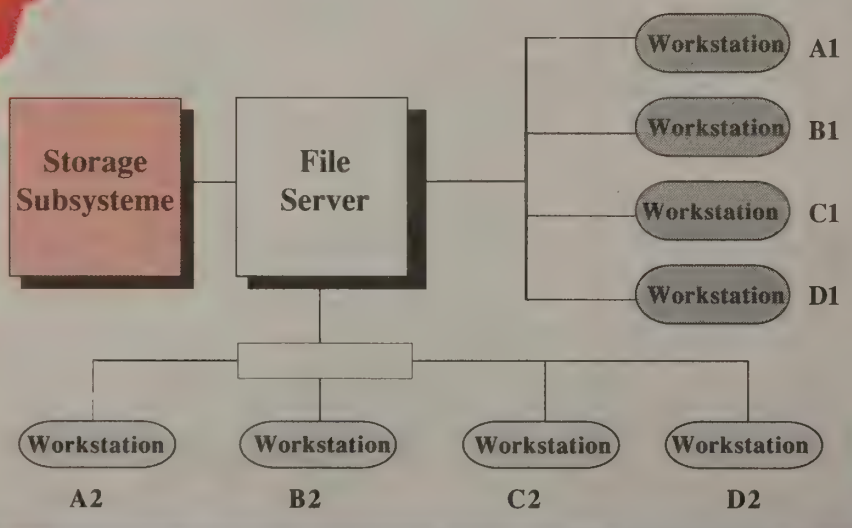

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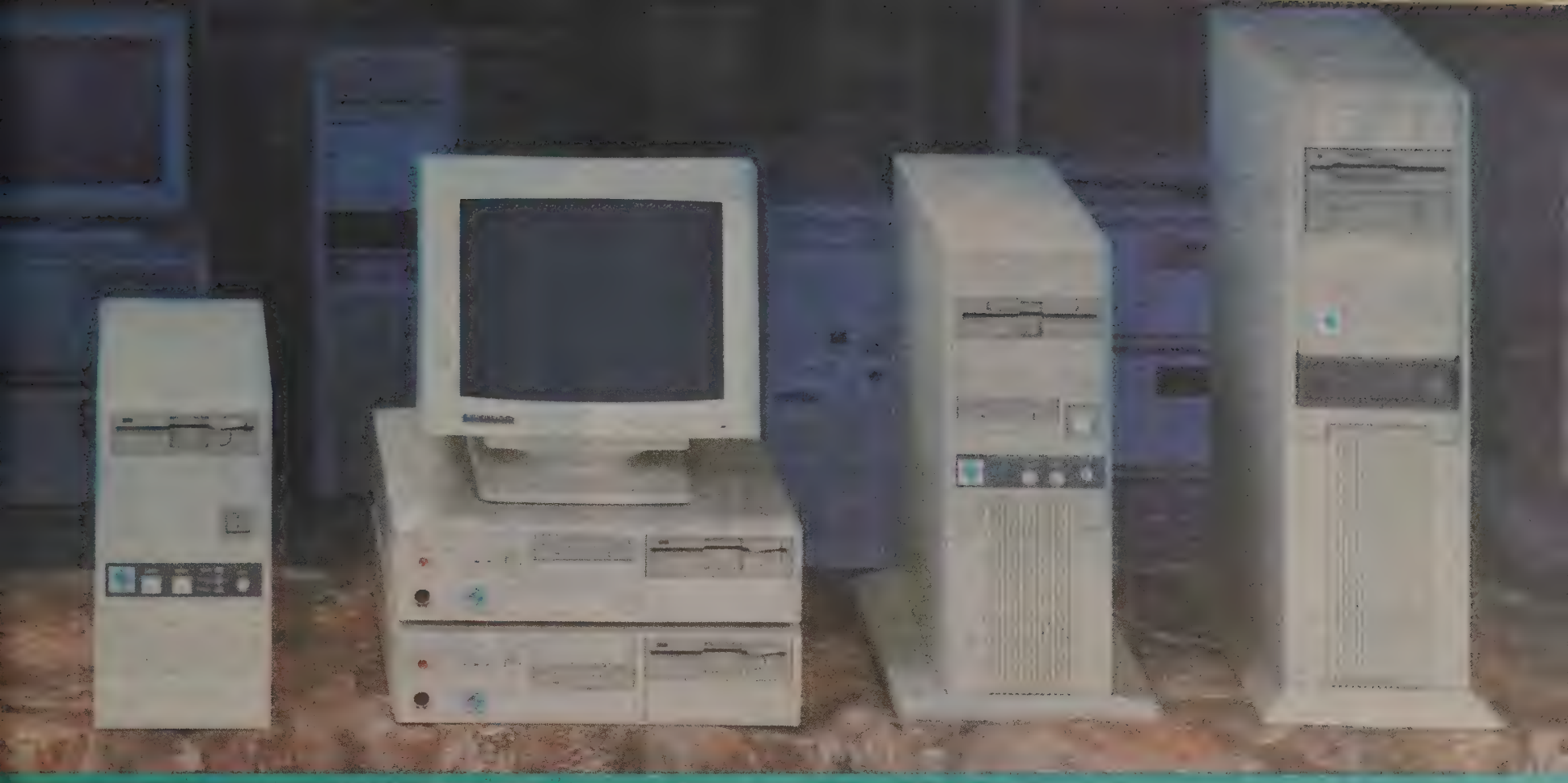

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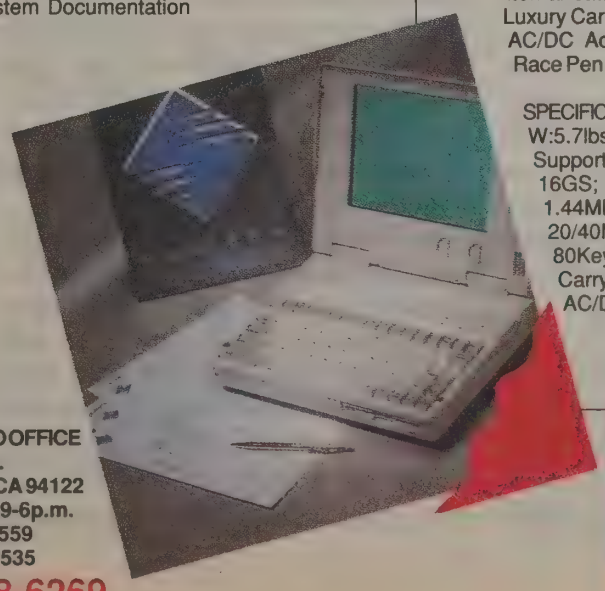

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INDUSTRY INSIGHT

OS/2, System 7, And Chip Wars

BY PAUL HOFFMAN

IBM PULLS OUT THE STOPS ON OS/2

OS/2 has become the whipping boy of the microcomputer operating system world in the past year. Microsoft threw so much weight behind Windows v3 and downplayed the need for OS/2 to such an extent that most people have written OS/2 off as a dead system. OS/2's giant demands for memory and the small number of OS/2 programs made it look like a poor choice. Many people assumed that IBM would just let OS/2 die a quiet death and would end up backing MS-DOS and Windows on the low end and UNIX (specifically, AIX) on the high end. Last month IBM made it clear that that was a wrong perception.

Starting immediately, IBM dropped the price on its two incarnations of the OS/2 v1.3 and said it would make the upgrade to v2.0 free. "Free" is not a word you usually hear from IBM when talking about system software. In fact, old-timers who were around in 1981 remember that IBM was the first big microcomputer company to make you pay for the operating system when you bought the computer. By guaranteeing a free upgrade, IBM ensures that no one will wait for v2.0 and that the number of OS/2 users will swell significantly in the short run. This is intended to have the effect of creating more demand for OS/2 programs and therefore get more software vendors to write OS/2 applications. IBM said that it would also upgrade current IBM OS/2 customers to v2.0 for a special price, to be determined later.

The new price of OS/2 standard edition is $150, less than half of the old $340 price. Many industry watchers noticed that this is, in fact, the same list price as Windows v 3. If you are an IBM DOS user, you can upgrade to OS/2 for $99 (and still keep your DOS). IBM's little-used OS/2 Extended Edition, which comes with a database, client networking, and communications manager, costs $690, still way too expensive for most people.

IBM's v2.0 should have some interesting features that IBM has been showing widely. The most important one is that you can run Windows programs under OS/2 directly. This means that IBM has a total hedge on the question of whether or not software manufacturers start to support OS/2.

You will be able to run OS/2, Windows, and MS-DOS programs at the same time in separate windows. Of course, it remains to be seen how well these non-OS/2 programs run under OS/2: Windows v3 is notoriously bad for running popular MS-DOS programs. However, people who have early beta versions of the OS/2 v2.0 say that it already does incredibly well with major Windows programs.

IBM is also working with Micrografx Corporation to make OS/2 programs run faster. Micrografx is rewriting the OS/2 graphics engine for performance and common sense. Current OS/2 graphics are, by most programmers' estimation, a horrible abomination forced on Microsoft by IBM. The GDDI interface used in OS/2 comes from IBM's mainframe world and makes very little sense on a microcomputer. Micrografx is also producing tools to help software manufacturers port from Windows to OS/2 quickly.

Now that Windows v3 has been in use for a year, the industry has realized that to do serious work with it, you really want an 80386 or better CPU and at least 4MB of RAM. Well, that's about all you need for OS/2. Since IBM's major customers, large corporations, have been buying 80386SX systems for the very low end and more powerful systems for others, the only upgrade most need to make

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

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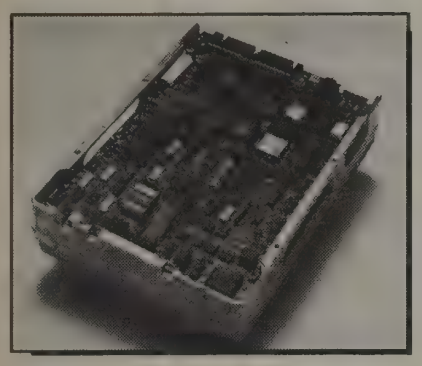

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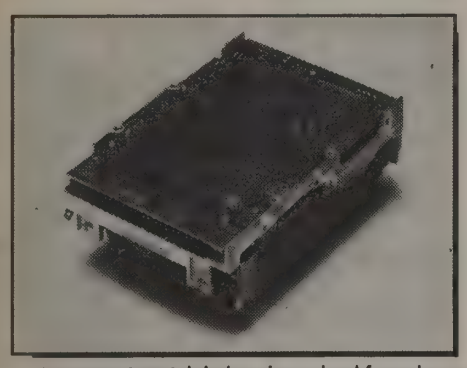

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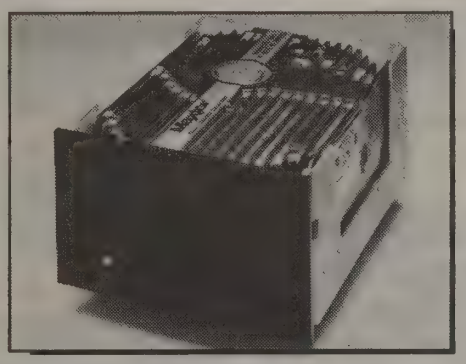

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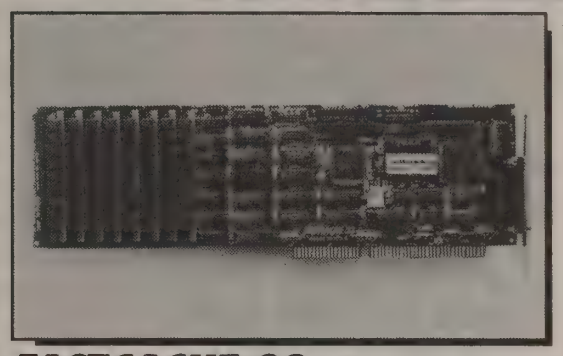

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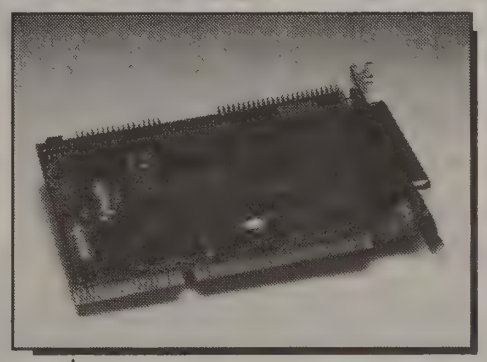

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is to add RAM, which is running at around $50 a megabyte. The biggest impediment may be people who want to run OS/2 on laptops to be compatible with the rest of the company: most laptops can only hold a total of 4 or 5MB of RAM, and the RAM often costs two or three times as much as it does for desk machines.

NEW CPUS, OLD CPUS: INTEL AND AMD FIGHT FOR THE PC MARKET

The past few months have been exciting for the CPU market. AMD released its long-awaited AM386, the first competitor for the Intel 80386. AMD's chip's main claims to fame are that it runs faster than any Intel 80386 chip (at approximately the same cost) and that it gives system manufacturers a second source of chips. The AM386 runs at 40MHz, which is faster than Intel's 33MHz. AMD is also producing chips at slower speeds, identical to Intel's. Although most of the interest is in the faster chips, hardware vendors have been looking carefully at the others, since they draw significantly less power than Intel's chips.

The question of a second source has plagued Intel since it aggressively tried to stop AMD from entering the market. Many hardware manufacturers have privately cursed Intel, since the 80386 chips are still in short supply and very expensive. They look at the AMD chip as both a good deal and a way to force Intel to produce more and more quickly. The AMD chips are also better suited for the rapidly growing laptop market, since you can slow down the processor to almost nothing and save huge amounts of power, thereby making batteries last longer.

AMD later announced the AM386SX to compete with the wildly popular Intel 80386SX. To compete with Intel, these chips also consume much less power, which is only important in laptops. AMD will also introduce a low-power 25MHz version of the chip, again besting Intel for speed. To date, no one has shown any bugs in the AMD CPUs, alleviating any worry about compatibility.

Although no threats have been documented, some industry insiders have said that Intel has made it clear that companies that rely on AMD as a second source sould soon be relying on AMD as a first source, since Intel would put them near the bottom of the allocation list.

Some system manufacturers will probably still stay away from AMD's chips, regardless of the benefits, in order not to anger Intel. Although no threats have been documented, some industry insiders have said that Intel has made it clear that companies that rely on AMD as a second source could soon be relying on AMD as a first source, since Intel would put them near the bottom of the allocation list. However, since Intel has not been able to service the entire industry with chips, many companies don't buy from Intel at all: they buy from chip vendors who can sell in smaller lots. These companies are the ones with the least to lose and were the first to announce new machines with the AMD CPUs.

Intel decided to fight AMD, not by lowering the prices on its 80386es but by making them essentially obsolete. They did this by announcing the new 80486SX chip, a 20MHz 80486 with a few important parts left off. The 80486SX is a regular 80486 CPU with the floating-point unit detached. That's right, the chip even has the floating-point unit, Intel simply disabled it. Cynical readers may note that since the 80486SX chip cost much less than the 80486, Intel reduced the price simply for marketing's sake. The new chip costs less than half of the 80486's price. This

Apple Releases System 7, Challenges Windows

Apple is still trying to go head-to-head with Microsoft. Apple's recently released operating system for the Macintosh is being marketed as better than Windows, even though they do not directly compete. In fact, the comparison between System 7 and Windows 3 is fairly silly, since the expectations of Macintosh and PC users are wildly different. The standard equipment and the software available for each platform cause users to want different features in upgrades.

The comparison between System 7 and Windows 3 is fairly silly, since the expectations of Macintosh and PC users are wildly different. The standard equipment and the software available for each platform cause users to want different features in upgrades.

The main features of System 7 include a friendlier main interface, inter-application communication that will be available to almost every program, virtual memory for many users, integrated networking, and a new printing system. However, these features come at a penalty: You need 2MB of RAM to run System 7, which is more than many people have. Apple has promised not to make System 6 obsolete for a few years, so most current users who cannot upgrade immediately will be able to keep running their programs well.

To upgrade to System 7, you can buy an upgrade kit with documentation from a dealer or get copies of the necessary floppy disks from online services and user groups. Since the number of new features is so high, it is likely that many people will in fact end up buying the full packages, a departure from earlier software releases. Apple is also updating most of its application software to work with System 7.

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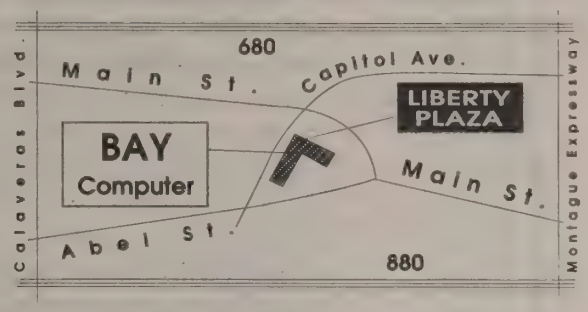

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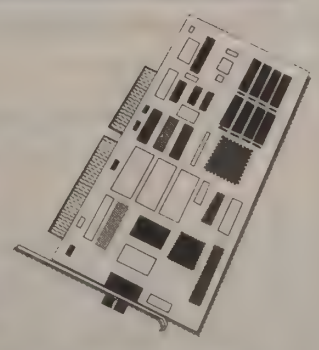

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shows just how much profit Intel makes on each 80486 chip.

The 80486SX runs faster than the 33MHz 80386, yet costs only $50 more. For 32-bit instructions, the new chip runs much faster. Thus, users who run Windows in 386 enhanced mode or OS/2 should see great speed improvements by using 80486SX systems.

Intel also announced the 80487SX, a "math coprocessor" for users who want to upgrade the 80486SX. The term "math coprocessor" has to go in quotes because the 80487SX is not a math coprocessor at all: it is a regular 80486. Intel not only purposely crippled the math capabilities of the 80486SX, it designed the chip so that you cannot simply pull the chip and replace it with an 80486 when you want faster math: you have to buy the 80487SX. That chip is just an 80486 with a few critical pins rearranged. The purpose of this switch is unknown, but probably is a way of preventing users from reselling the unneeded 80486SX chips after upgrading.

Intel has told hardware manufacturers to put an empty socket in 80486SX systems, although not all are doing that. The cost of buying an 80486SX and later upgrading with the fake 80487SX is significantly higher than just buying an 80486 to start with.

So as not to seem too nasty with the upgrade, Intel also said that it may design other chips that can go in the 80487SX coprocessor slot. Intel might make faster CPUs that can be put in the slot, or even come up with other types of coprocessors, although this is unlikely unless pushed. Third-party chip companies may come up with more creative uses for the slot.

Michael Slater, publisher of the widely respected *Microprocessor Report*, described the 80486SX announcement in harsh terms. "The marketing audacity to produce three separate products (the 486SX, 486DX, and 487SX) with three very different prices from essentially one die is an example of Intel's expertise in extracting the most revenue from its designs. It is also a graphic illustration of the very loose relationship between manufacturing cost and price."

Many companies announced systems based around the 80486SX the same day as Intel announced the chip, but few said whether they thought that these would eventually replace their 80386 product lines. Since

Since AMD is banking on the long-term interest in 80386es, Intel may use the 80486 to help knock AMD out of the market in the short run and again become a single source.

AMD is banking on the long-term interest in 80386es, Intel may use the 80486 to help knock AMD out of the market in the short run and again become a single source.

Continued on page 212

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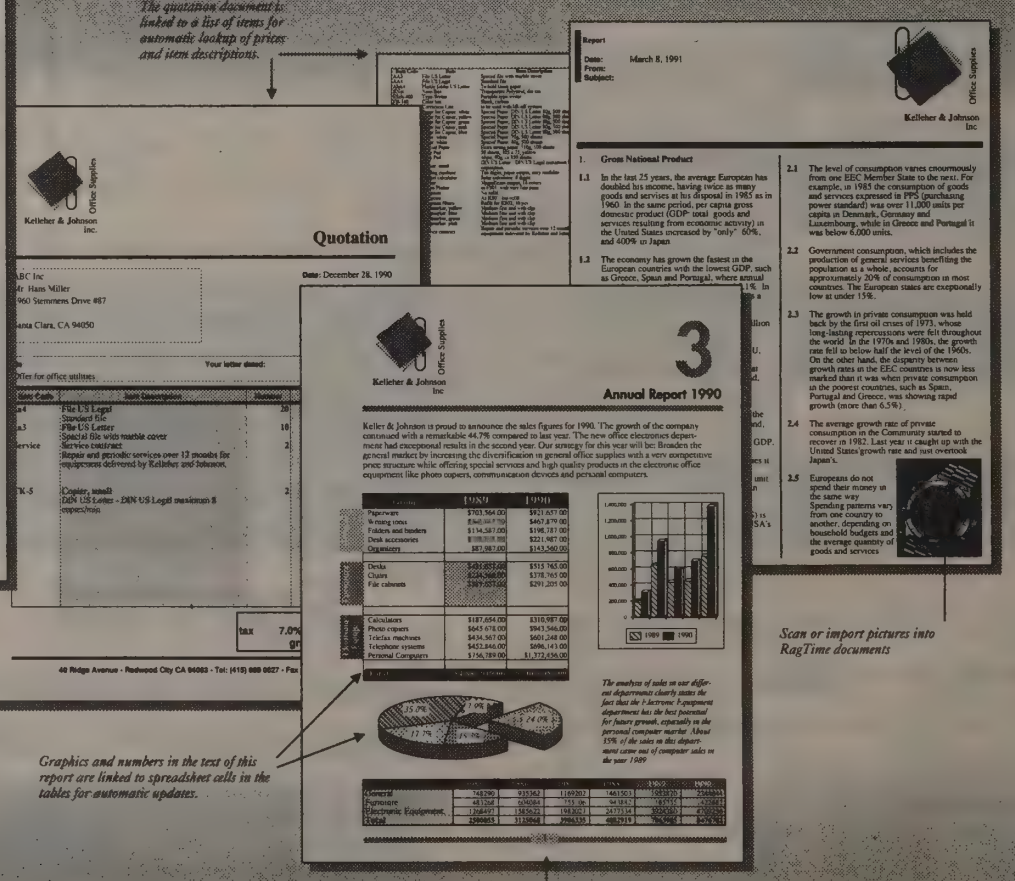
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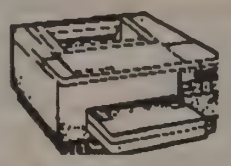

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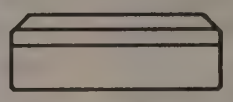

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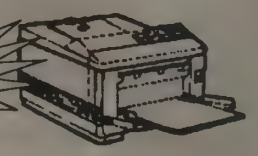

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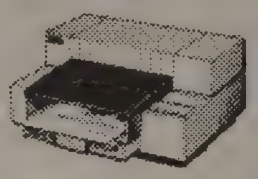

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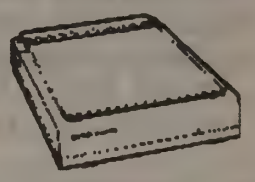

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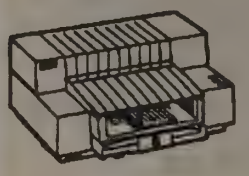

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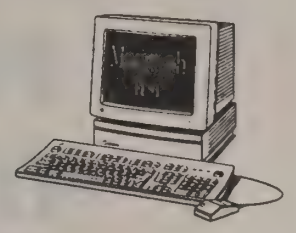

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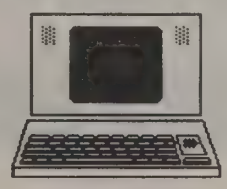

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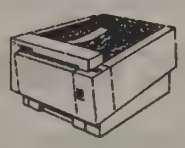

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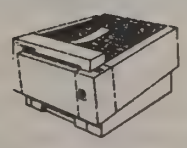

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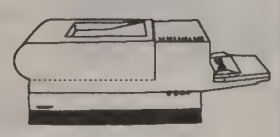

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Practical Privacy Protection, Unless Congress Prohibits It

BY JIM WARREN

This column concerns our futures that we can create, *if* we protect our options.

PROTECTING AGAINST PEEPERS

Computer and electronic-mail users are becoming increasingly concerned about information pirates and email eavesdroppers.

Some naive folks to think legislation will halt such intrusion.

Realists, however, are urging technical protections against technological surveillance. Numerous speakers at the Computers, Freedom & Privacy Conference stated that the *only* real protection against such surveillance and data theft is robust, verifiably secure encryption.

REALIZABLE FANTASIES

Many say "public key" crypto is the most secure—and also the most easily used. It's actually a two-key system, a "key" being simply a number. Everyone can have your "public" key, using it to encrypt information for you. But only you, knowing the "private" half of your two-part key, can decrypt the data.

Recently, numerous major companies have joined, or appear about to join, the public-key bandwagon. They include DEC, Sun, Apple, Microsoft, Lotus, Novell, etc. They seem likely to endorse the public-key implementation developed by RSA Data Security (Redwood City).

Copyright © 1991 by Jim Warren. All rights reserved. *Jim Warren organized and Chaired the recent First Conference on Computers, Freedom & Privacy, sponsored by a dozen organizations. He founded* InfoWorld, *the DataCast proposal for paperless electronic newspaper, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS' "Computer Chronicles," founding editor of* Dr. Dobb's Journal, *and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

LOCKSMITHS NEED AGREEMENT

In all cases, the transmitter must have an encryption tool, a program or device, and the receiver must have a matching decryption tool. Thus, there must be widespread agreement on any crypto that is to be widely used.

The US government adopted the Data Encryption Standard (DES). But its 56-bit key was publicly proven crackable by Stanford's Marty Hellman, even before DES was adopted. The National Security Agency (NSA) opposed Marty's recommendation of an uncrackable 64-bit key.

Further, there are widespread—unproven—rumors that NSA has a "back door" into anything encrypted with DES, so they don't even need a Cray to crack it. Its source code was never released by IBM and NSA, its developers, so users cannot verify that it's secure.

PROTECTING FAX & PHONE

On related fronts, the SecureFX fax encryptor can protect fax transmissions (from Cylink, Sunnyvale). It reportedly includes RSA-licensed, public-key crypto, has tamper detection that zeroes-out keys before they can be read, and works with any pair of standard faxes. Each fax plugs into a SecureFX, plugged into the phone line. Sadly, the units cost about four times what a fax costs. (Watch for faxes with built-in crypto.)

Fujitsu may be the first offering a cordless consumer telephone that scrambles communication between the handset and the base-station (Azet-R10). This will render most nosy neighbors' scanners useless and force wire-tappers back onto the telephone poles.

WHO'S PEEPING?

On the other hand, undetectable monitoring of any voice, fax, or data phone line—from anywhere in the nation—is reportedly implemented in current-generation US phone systems. These optional surveillance facilities are reportedly far beyond anything the telcos ever requested or showed any interest in wanting.

Even more curious: Local and state police have said *they* can't get use of it, even for a court-authorized phone tap. They still have to climb a pole or clip onto lines in the central office (c.o.), just like J. Edgar Hoover's surveillance of the Kennedys, Martin Luther King, and '60s pacifist groups. [pacifist: someone who's always trying to start a peace]

So, who uses the phone-tap-from-anywhere facilities that the telcos never wanted and aren't available to local and state cops?

MOST PEEPERS AREN'T CRACKERS

Irresponsible news media and mythological movies have inflamed widespread fear that droves of omnipotent computer crackers will invade every computer—and probably make your microwave irradiate your children, too. Even columnist Jack Anderson's staff got suckered into naively touting cracker terror.

In fact, almost all computer criminals and data-peepers are employees, managers, agents, and politicians—working on the inside—using authorized access for covert and/or unauthorized purposes.

Fujitsu may be the first offering a cordless consumer telephone that scrambles communication between the handset and the base-station (Azet-R10) This will render most nosy neighbors' scanners useless and force wire-tappers back onto the telephone poles.

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Example: The Mayor of Colorado Springs secretly monitored confidential electronic correspondence between members of his city council, using his access as system operator. (He is also president of the US Council of Mayors.)

Of course, robust, verifiably secure crypto would cure such automated surveillance. If permitted.

CONGRESSIONAL CALL FOR GUARANTEED INSECURITY

Early this year, Senators Biden (D-DE) and DeConcini (D-AZ) buried this sentence in Senate Bill 266, an "omnibus anti-terrorism bill," introduced on the House side by Rep. Tom Lantos (D-CA):

"... providers of electronic communications services and manufacturers of electronic communications service equipment shall *ensure that communications systems permit the government to obtain the plain text contents of voice, data, and other communications* when appropriately authorized by law." [emphasis added]

If this is passed, all US crypto systems will have a hole in them—a back door for "authorized" agents. Industrial and foreign spies wouldn't have to *wonder* whether encrypted data and communications were crackable; the law will guarantee it. Spies would need only to crack it, or simply obtain access through any "authorized agent" they could bribe or blackmail.

Well, Desert Storm died and the terrorist terror went away. (Terrorists are *so* undependable.)

So, this "data insecurity guarantee" promptly resurfaced in an "omnibus anti-crime bill," S618. (US criminals are more reliable than terrorists.)

WHAT'S MORE IMPORTANT—PEOPLE OR PROSECUTION?

Admittedly, if secure encryption were available to citizens and companies, criminals might also use it. But, even if law-abiding citizens are prohibited from having secure crypto tools, criminals can still have them—the techniques are widely published and well understood in international computer circles.

Should everybody be permitted to adequately protect their communications and records—or should such security be available only to lawbreakers? Do police and prosecutor needs justify guaranteeing insecurity for everyone else?

The Beltway bureaucrats who insistently push this legislation will only be stopped by a widespread outcry from an informed, vocal public.

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In the last several months, I've given a number of lectures deriving from this Spring's premier Computers, Freedom & Privacy Conference. And, I gotta say, it is the most exciting and provocative subject I've presented since '70s lectures about "personal computing"—when microcomputing was an infant industry unknown to an unsuspecting population.

Also, audiotapes of the CFP Conference are (finally!) available. Contact Recording, Etc., Palo Alto, CA; (415)327-9344, 321-9261/fax. Pre-tax prices are $14.95/tape, $34.95/day (5 tapes), $59.95/full set (15 tapes). ■

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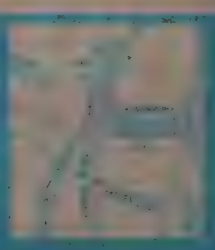


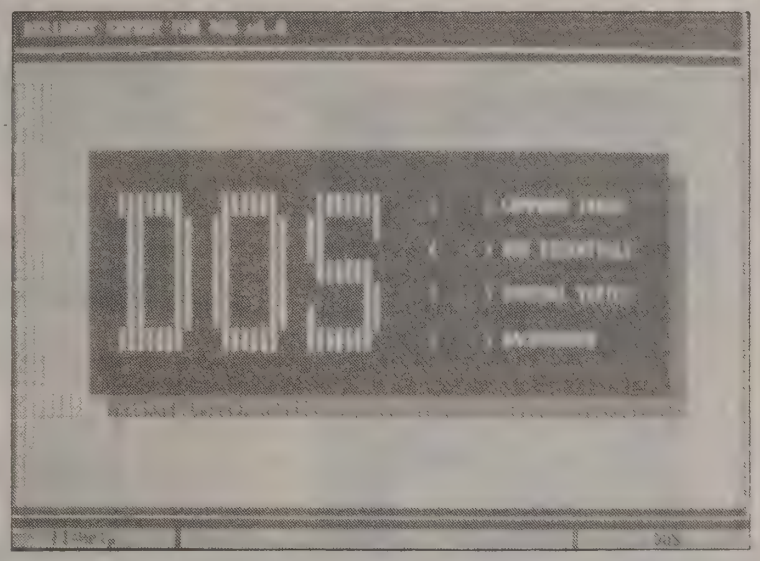
Help For DOS Users

Resident Expert Fits Easily In A Laptop And Presents Clear Answers To All Of Your Questions About DOS Commands

BY ED KAHN

Portable computer users often need their DOS reference books when they are travelling. It is unlikely they will be dragging along bulky reference manuals when they really want to travel lighter by using smaller computers. Even if the user is not on the road, looking up syntax and other information in a confusing reference manual is seldom done with enthusiasm. A new program from Parsons Technology has just eliminated the need to refer to DOS reference manuals for most inquiries.

Resident Expert is a powerful, yet simple, program in which even a novice user can easily find information about any DOS command. It can be installed as either a memory resident application or a standalone program. I prefer working with Resident Expert as a standalone program—I seldom need help when I am in the middle of another application. Either way, it works like a charm. If your system has expanded memory, Resident Expert can be installed so that it requires only about 1K of RAM and places the rest of the program in expanded memory. This is a well-thought-out program. Although there are similar programs, I like this one best because it has so many features.



Resident Expert installs itself into its own subdirectory, making installation simple. It can be placed in your path to make this program available from any subdirectory, or you can set up a simple batch file that will allow you to get into the program to instantly find just the information you need.

The program comes with a batch file that can be placed in a path command directory. You can then attach the DOS command for which you need help. Let's say you want to know how to use the xcopy command. Simply type "DOS xcopy" and hit return. You will be instantly taken to a screen that tells about xcopy and provides you with illustrative examples. Also, terms that you might not understand are highlighted in this discussion. If you move the cursor to one of these terms and hit return, you will be taken to a discussion of that term. By hitting the left arrow key, you can move back to where you began, one screen at a time. This is an extremely effective use of hypertext.

You can use the program by typing "expert" if you are in the right subdirectory or have put the Resident Expert subdirectory in the path statement. This brings up an opening menu where you can learn about the Resident Expert, any DOS command, or other subjects discussed.

This is a really wonderful program so simply put together that no user will be overwhelmed. Sometimes users find they simply cannot understand the documentation for many DOS commands, and while this program presents everything even a beginner can understand, it does not take away from an understanding of the power of these commands.

Sometimes users find they simply cannot understand the documentation for many DOS commands, and while this program presents everything even a beginner can understand, it does not take away from an understanding of the power of these commands.

In addition to the DOS help, the program also offers help in getting started with DOS. If you enter the program by calling up "expert," you will have several options that walk you through the basics of DOS, organizing a disk, viewing files, and managing files.

This program takes up less than 360K on the hard disk, so even the most crowded hard disk has room for it. The program works with all versions of DOS. If you have trouble using the program—which is not likely—you can contact Parsons Technology through a CompuServe forum, by telephone or by fax. The instruction manual has a simple tutorial that walks you through the basics of the program. There is also online help that will answer most of your questions. Finally, there is an additional "readme" file that contains information not included in the manual. ■

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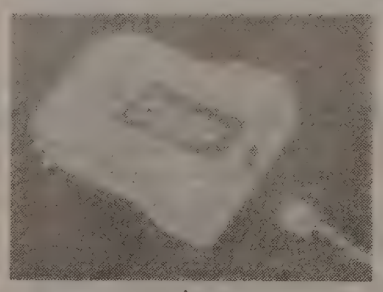

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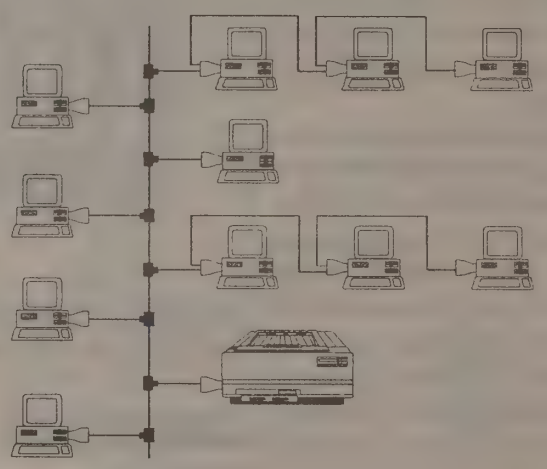

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Computer Of The Month

Fora LP-386C

Laptop buyers now have a wide range of models from which to choose. In the last year, the slim lightweight models have garnered much attention, but the heavier models still are available and are as frequently released as the sporty lightweight units.

Before recommending the right portable for someone, I ask the prospective buyer many questions. If the main purpose is for use on an airplane, then of course the lighter the better. On the other hand, if the user generally works in a single or a couple of locations, the heavier machines offer advantages. This month's computer is 14lbs.—heavy by today's standards, but so filled with features that it will clearly be the right choice for users who value features over portability.

If the standard 386 chip running at a blazing 20MHz is important for you, the Fora LP-386C, one of the few portables with this feature, is the machine to examine. This is not an SX, but a full-fledged 386.

The Fora has a lunch pail shape, measuring 13.7" x 8.5" x 4.3", which differentiates it from the more common clamshell design. In many ways, this computer looks like the Compaq 286 of a few years ago. It has a removable keyboard, which hides the battery compartment. It includes a 40MB hard disk (a 120MB model is available for an extra $1000) and a 1.2MB floppy drive.

The display measures nearly 11" diagonally—a bit larger than most of the laptops I've reviewed. And of course it has a VGA screen with 640 x 480 resolution and thirty-two scales of gray. An external VGA monitor is easy to attach through the port on the back of this computer. Fora includes a feature I particularly like. When you open the display, a little spring-loaded button pops up, and when you close the top it is pushed down. This button tells the computer whether the top is open or closed. If you leave it closed and turn on the computer, it automatically

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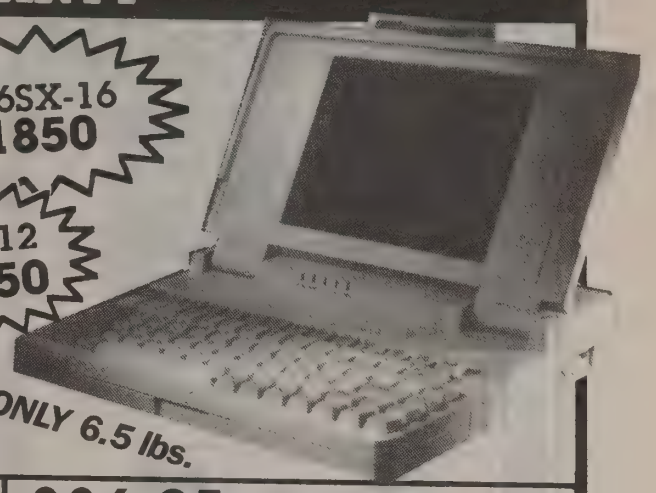
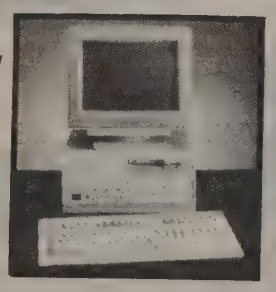


486-33 w/128K Cache



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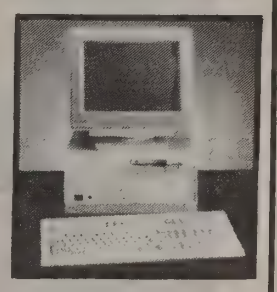

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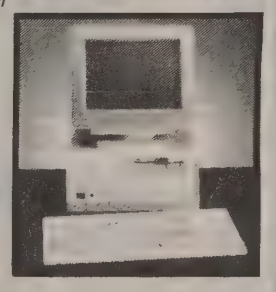

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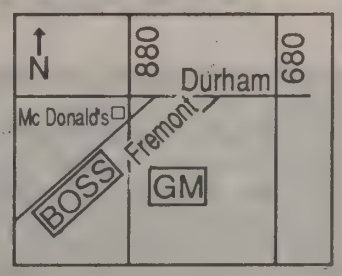

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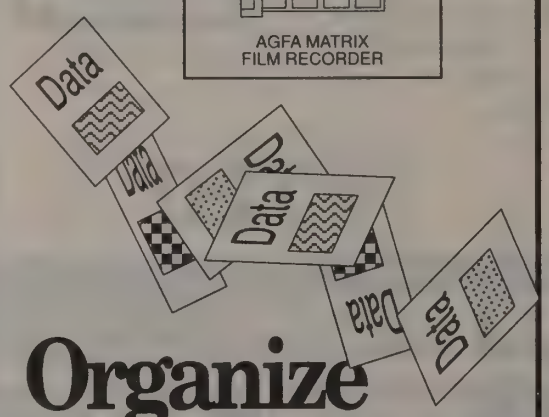

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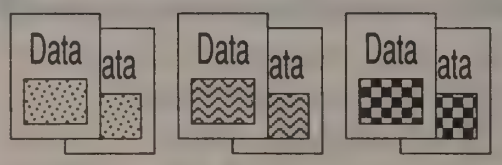

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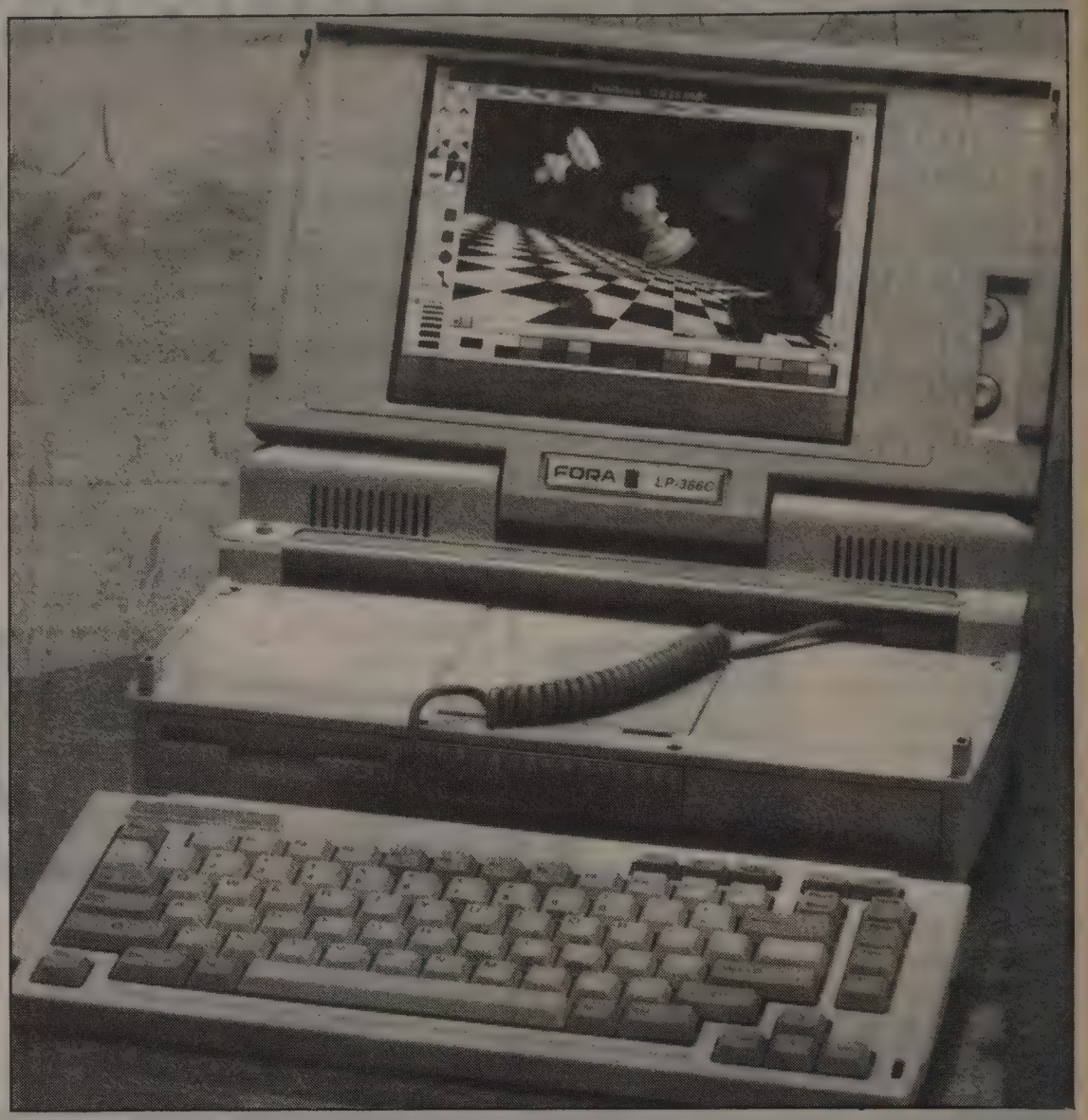

expects an external monitor, eliminating the need to set any buttons or configure any software. You can, if you like, use the included software to configure the computer for an external monitor, but this button arrangement simplifies the process.

The feel of the keyboard is more to my taste than many of the smaller portables. It features 86 full travel keys and has a reasonable layout. Although I may have placed some of the keys in other locations, in general, it's acceptable. I don't like embedded numeric keypads, but like almost all portables, this is included here. Fortunately, Fora knows that there are people like me out here and makes available an accessory numeric keypad ($129) that screws onto the right side of the removable keyboard. This goes a long way toward eliminating my complaint. Since the case will not close with the numeric keypad accessory attached, this is clearly designed for users who are not using the computer on the road. If this keyboard is still not to your liking, you can attach any PS/2 style keyboard through the port on the back of the LP-386C.

The battery setup on the Fora is good. The rechargeable NiCad unfortunately supports only about two hours of use, but it does have a reasonably fast recharge time of two to four hours. The computer is designed with lots of energy saving features which are in effect only when the machine is battery powered. The energy saving features can be configured through the setup program. Again, this is a machine that is designed for the person who desires this as their primary computer.

The computer is a powerhouse. It comes standard with 2MB RAM and can be expanded up to 8MB ($1495). An internal 2400 baud modem ($295) is available. An expansion chassis ($899) is also available. This accessory includes a 5.25" drive as well as three full-size expansion slots.

This computer comes with a twelve-month warranty, MS-DOS 4.01, and adequate documentation. Unfortunately there is only one serial port, although a second is available as an accessory ($89). A carrying case costs $95.

If you need a real 386, this may be the only game in town in this size. If you want a heavier machine with more accessories and the feel of a desktop unit, the Fora LP-386C is worth examining. ■

RESOURCES:

LP-386C $3995.00
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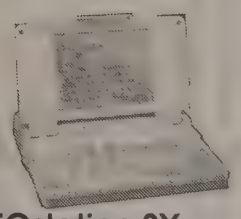

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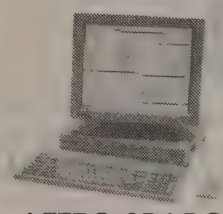

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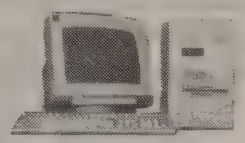

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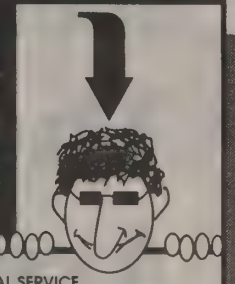

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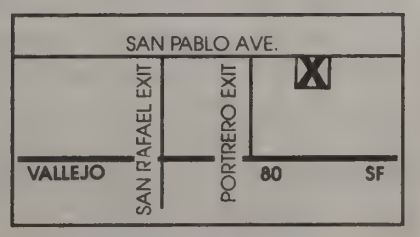

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Remote Access Extends The Area In Your Local Area Network

With pcAnywhere And Carbon Copy Your Office Computer Is Only As Far Away As Your Modem And The Phone

BY PETER JOHN HARRISON

Local area networks are providing businesses with a less expensive alternative to using mini computers for critical applications, like point-of-sale and purchase order management systems. LANs often provide an important link between departments that must share data. Linking, for example, the sales group that takes purchase order information with the warehouse group that assembles and ships the orders. But local area networks are designed to be just that: Local.

What happens when your sales agent is working with a laptop at a customer's office, or you want to add a new office location without having to add a new LAN? Or you already have several LANs and would like to administer them from a central location?

Cross-town or cross-country—there are real advantages to extending your LANs' boundaries beyond the building's walls where they're installed. Remote access software packages, like pcAnywhere and Carbon Copy, allow your networks' borders to be stretched. These two packages allow remote or off-site users to connect from one PC to another (called the host) and then work on the host system from their keyboards and monitors.

Remote access packages work well between standalone PCs, but they really shine when used for access to a LAN. One firm provides a client in Maine with access to its Carson, CA, local area network, and does much of its network administration, troubleshooting, and systems support from their San Francisco headquarters. To allow remote access to the Carson LAN, these workstations were equipped with high-speed (19.2K baud throughput) modems and Dynamic Microprocessor Associates pcAnywhere "Host" program. Remote users in Maine and support specialists in San Francisco were provided with identical modems and pcAnywhere's "Remote" access software.

When clients in Maine need access to the LAN, pcAnywhere dials into one of the Carson workstations. Once connected, commands entered on the keyboard in Maine are routed to Carson, and information displayed on the workstation monitor is sent back to the remote and displayed on the remote user's screen. It's almost like having a 3000mi.-long cord for the keyboard and monitor. Reports can be printed at either location, at both the host and remote locations, or can be stored on the remote system's hard drive.

Using a remote access package can help simplify the task of maintaining a LAN away from the company headquarters. By dialing in as a remote user, LAN support specialists can troubleshoot software problems, do systems maintenance and administration, and even install software—all from the technician's desk, wherever it is. While

Remote access packages work well between standalone PCs, but they really shine when used for access to a LAN.

Peter Harrison, a San Francisco-based data communications and connectivity specialist, can be reached via Usenet (peterh@well.sf.ca.us) or CompuServe (74017,1716).

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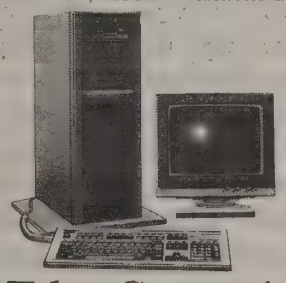

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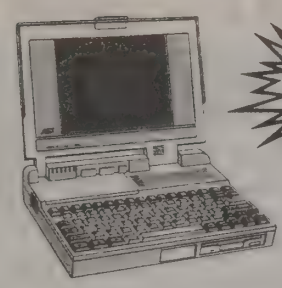

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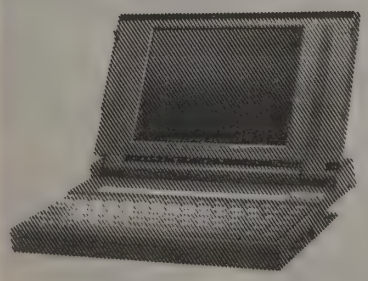

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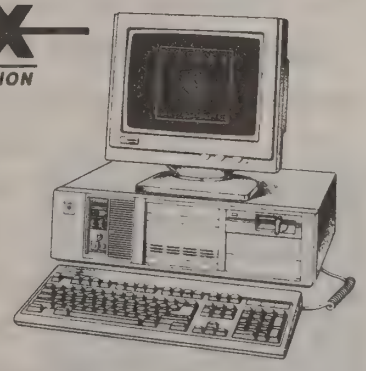

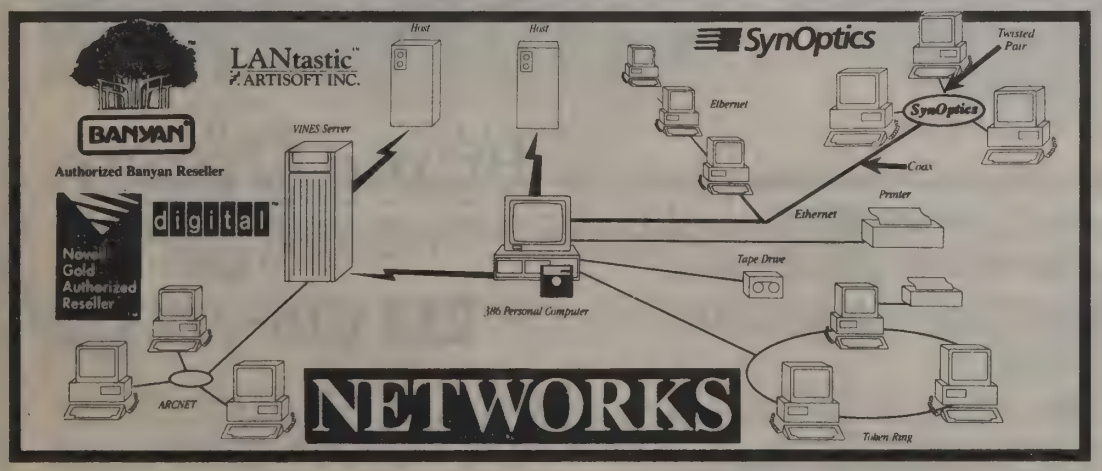

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this doesn't eliminate the need to have someone at the site who can do basic administrative tasks, including system backups, remote access capabilities reduce training costs for local administrators and cut the number of times outside support specialists have to travel to the LAN's location.

pcAnywhere and Carbon Copy display the same information on both host and remote systems, and allow both users to continue to use their keyboards. This comes in handy when a user needs help with a program feature, but can't explain the problem. By dialing into the user's workstation, off-site specialists can view the problem just like the user, then talk or type the user through the solution. Problem solving using a phone and a remote access package is almost like having someone right there to help and offer advice. This cuts down on both time and frustration, since problems usually get resolved more quickly, especially when compared to support that only uses voice phone. Using remote access cuts phone costs, too.

There are some things remote access programs can't do or don't do well. Some TSR programs and programs that use "hot key" combinations may not work correctly on either the host or remote systems. Programs like "pop-up" spelling checkers and thesauruses may not work at all. Using different kinds of monitors on the host and remote systems can also cause problems with programs that have graphical screens—including some word processors, Windows, and DESQveiw. Windows users may find that the current generation of remote access programs won't work with all programs.

Modem speed also affects the performance of a remote access package. A high volume of data moves through the phone line; it helps if both systems are equipped with compatible high-speed modems. Slower modems will work, but screen updates drag along at 2400 baud, and even 9600 baud seems slow when you're used to the almost instantaneous response generally associated with PCs. If you plan on using a remote access program frequently, I recommend investing in a pair of high-speed modems—the faster the better.

Security is another important consideration. Once you provide remote access into a system, anyone can connect with it. Both pcAnywhere and Carbon Copy can be set to require a password before allowing access to the system. However, passwords can be discovered, leaving your system and its data vulnerable. To protect a system from casual intrusion, pcAnywhere IV offers a call back option that you can specify for some or all of your remote users.

Call backs work like this: When remote users dial the host system, they enter a user name that both identifies the caller and the location, something like "PETERH@HOME" or "STORE11." Assuming the user knows the right password for the user name, the host system hangs up the phone and calls back at the phone number registered to that user. User call back almost guarantees that people dialing in are who they say they are, and shifts most of the long-distance calling costs back to the host.

pcAnywhere and Carbon Copy are both great tools for anyone who can't be where their data is. For these people, they may not be able to take the office with them, but (with a little help) they are only a short phone call away. ■

RESOURCES:

pcAnywhere IV
Dynamic Microprocessor Associates, Inc.
1776 E. Jericho Turnpike
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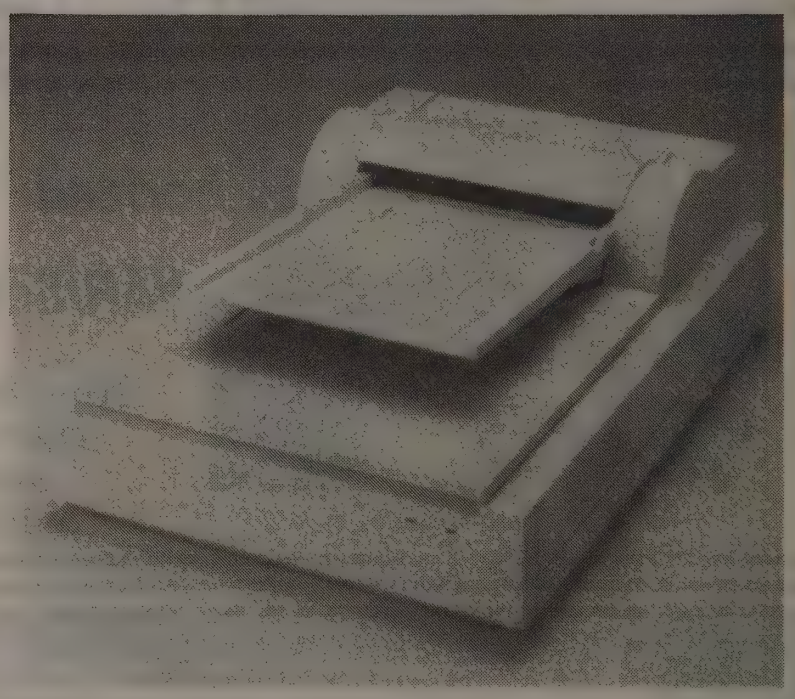

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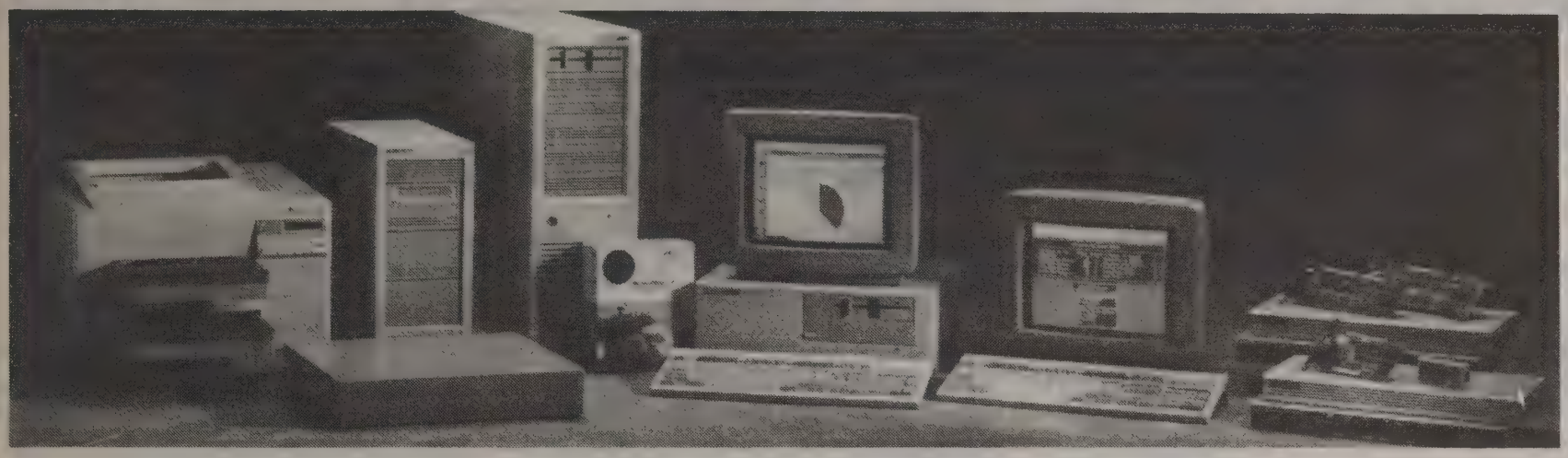

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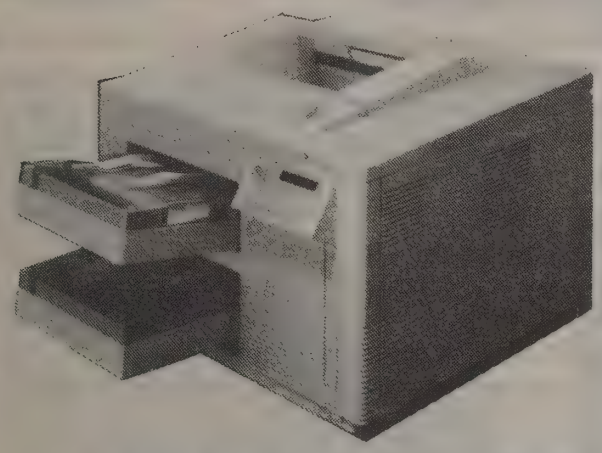

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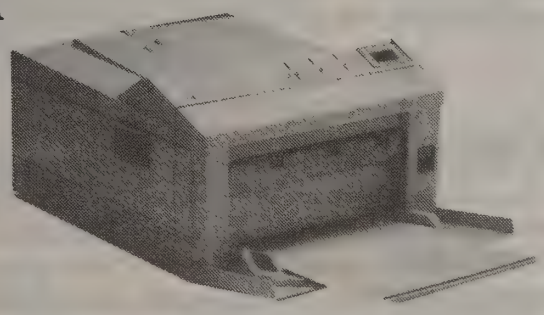

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Intel's i486SX: The Perfect Chip For Network Servers?

BY WAYNE A. YACCO

Intel's latest and greatest started shipping in mid-April. It's called the i486SX, but it's not at all what its name might lead you to believe. The i486SX is not only well suited to service as a network server, its low cost could make it the best chip Intel has for the job (with a minor qualification I'll get to later). Yet Intel is promoting the i486SX for another position in the market, and that fact alone may keep it from immediately realizing its full potential in servers.

From its name, you might suppose that the i486SX has the same relationship to the i486DX that the i386SX has to the i386DX chip. The i386SX is a 16/32-bit version of the i386DX chip. Both of these chips have the same 32-bit internal architecture, but the SX version has a 16-bit external data bus. It can crunch numbers as fast as a DX, but it can't communicate with the outside world as fast. Nor can it use the faster support chips that are used with the DX's 32-bit data bus. It does save power, and that makes it great for laptops. It costs from a half to a third as much too, and that makes it just tolerable for low-end systems. But it can't give you as much throughput.

LOCAL AREA NETWORKS

The i486SX and DX are not analogous, however. Both internal and external buses are a full 32 bits wide. The SX can process data every byte as fast as an i486DX. It just can't process all of the same types of data. The i486SX doesn't have the DX chip's built-in math coprocessor. Well, it does, but it's been deliberately disabled. The built-in cache and memory-management unit haven't been disabled though. So, ordinary integer, data-movement, and logical operations are just as fast as they would be in an i486DX of the same speed, but at a cost close to that of a 33MHz i386.

How can they afford to do this? The answer is related to an important point I've left out (that qualification I mentioned earlier). But I'm getting to it.

Copyright ' 1991 by Wayne A. Yacco. All rights reserved. *An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at Box 269, Burbank, CA 91503.*

THE 486SX AND NETWORKS

For Novell NetWare, the lack of an internal math coprocessor is no lack at all. NetWare doesn't use one even if it's there. That's not an indictment of Novell's network operating system, a NOS just doesn't do much floating-point math. (If another application does require a math coprocessor, there is an i487SX, and Intel encourages board makers to provide an upgrade socket for it on their boards.) Therefore, a server based on this chip would save the cost of a full-blown DX chip while providing the same performance—almost. (Enough suspense, here comes that qualification.)

Intel has positioned this chip for a market segment it identifies as "performance midrange." The three million users in this market of $5,000 to $8,000 systems are the ones that are buying 33MHz i386DX-base platforms. But a 33MHz i486 is several times faster than an i386DX. To get performance superior to the 33MHz i386DX, the i486SX only needs to run at 20MHz. And that's how Intel has limited the usefulness of the i486SX for servers. It's only shipping in a 20MHz version. Until faster versions ship (and they will), its speed will limit the number of workstations you can support—relative to the faster i486DX models.

Then why buy an i486SX server? For now, just for the advantages of the memory management unit, the internal cache, and the chip's totally different architecture. These features will make systems based on it both cheap and fast. Intel's i486 chips all share a core instruction set of single-cycle instructions. It's not a pure RISC chip because the 8086 family's complex (CISC) instructions are also supported to maintain 100% compatibility. So, it's not risky, but it is RISCy. And it's about 25% faster than the fastest i386DX equipped with a modest external cache (at extra cost). You will be able to support more workstations with it than with a 386.

INDUSTRY SUPPORT

Furthermore, those in the know say the cost of systems based on either chip is going to be about the same initially. Edward Ying is the product manager for board-level products at Micronics, one of the industry's better-known purveyors of quality motherboards. Ying says that "Once people start shipping in volume, the 20MHz 486SX will be priced about the same as the 33MHz 386DX." Of course, that will eventually affect the market and "force the price of the 386DX systems down," says Ying. But not long after that happens, the next generation of 486SX chips will leave today's 386 chips in the dust—and they should still be cheaper than a 486DX.

Five companies have already announced machines using the chip:

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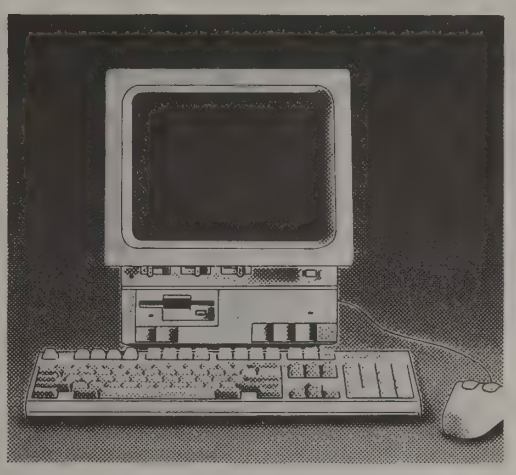

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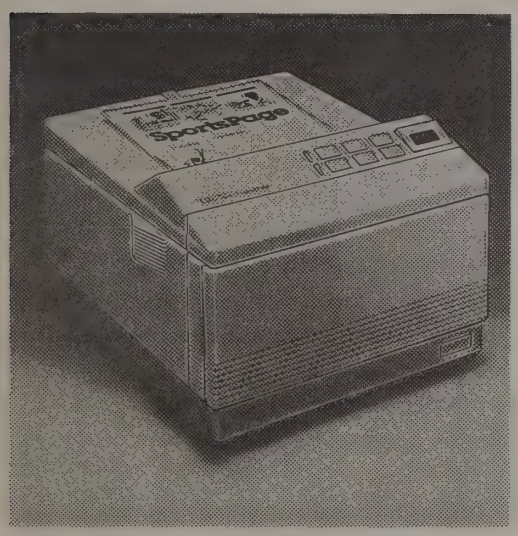

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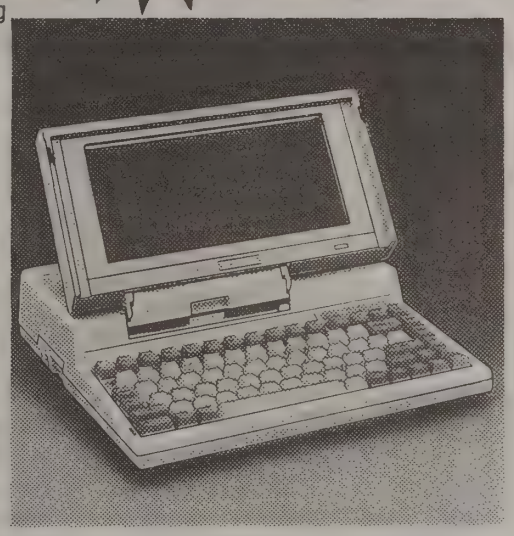

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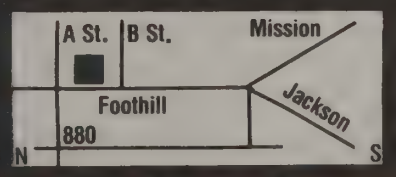

RESOURCES:

Unirule Industries
3200 S. Halladay St.
Santa Ana, CA 92705
(714)641-0577

ALR, AST, IBM, Acer, and American Mitac. Ying expects the savings between these SX machines and i486DX systems to be between $500 to $1,000 on the street. List prices differ by about $2,000.

It's also possible that at least a few of the smaller vendors (those that buy gray-market chips and don't have to abide by Intel policy to get them) will test the proposition that some of these chips will really run at 25MHz—maybe faster. No matter what the outcome, the i486SX seems certain to result in more speed at a lower price. It's just a matter of degree.

UNIRULE'S RISERS FOR LAN TESTING STATIONS

Some time back, I mentioned an Ergotron LAN testing station that held a pile of workstations in very little floor space. There seemed to be considerable interest in it (Ergotron told me it amounted to several major corporate orders).

Now, I have just finished installing a stack of two electronic risers that should also interest those of you who configure networks. These workbench risers from Unirule Industries are made in the States from heavy-gauge steel. They come punched for standard duplex electrical outlets, and with built-in wiring channels. They're available in lengths of 60", 72", and 96", and range from about $75 to $85 each.

However, assembling Unirule's risers provided a mixed experience that left me both pleased and disappointed. One unit arrived with only minor dents and scratches, but one of the electrical knockouts was completely missing. How could they overlook something so obvious? The other unit was so badly bent on one end that it took a couple of extra hours to straighten and assemble. They also neglected to include sufficient hardware for assembly.

On the one hand these risers were very stable, supported several hundred pounds, and cost very little. So I liked them. On the other hand, I was disappointed that an American company seemed to take so little interest in the finished quality of its product—especially at a time when there is great concern about our ability to rise to the challenge of foreign competition.

Unirule probably would have exchanged the risers had I raised the issue, but repacking and returning them would have been a lot of trouble. So I settled for them, imperfect though they were. I was able to quickly elicit a surfeit of nuts and bolts with a phone call.

In the end it was very much like childbirth—a lot of pain and cursing followed by the joy of seeing a newborn baby. I am quite pleased with the finished assembly. It's bolted firmly across the top of my desk and integrally grounded. Several workstations, a Datacopy GS Plus scanner, my Polaroid Digital Palette CI-3000, and a Mac IIcx are already strapped to its lower level. Four or five more workstations will occupy the top level as soon as the rest of my webbed tie-downs arrive. All of the utility I expected is there, and Unirule's price is so low that they still come out a bargain.

If you could find another source for Unirule's risers that provided better service and quality control, they would be worth a slightly higher price.

In fact, I have recently seen what I believe are the same risers in a catalog. This particular catalog didn't respond to my inquiries—so I can't recommend it—but there are probably others. ■

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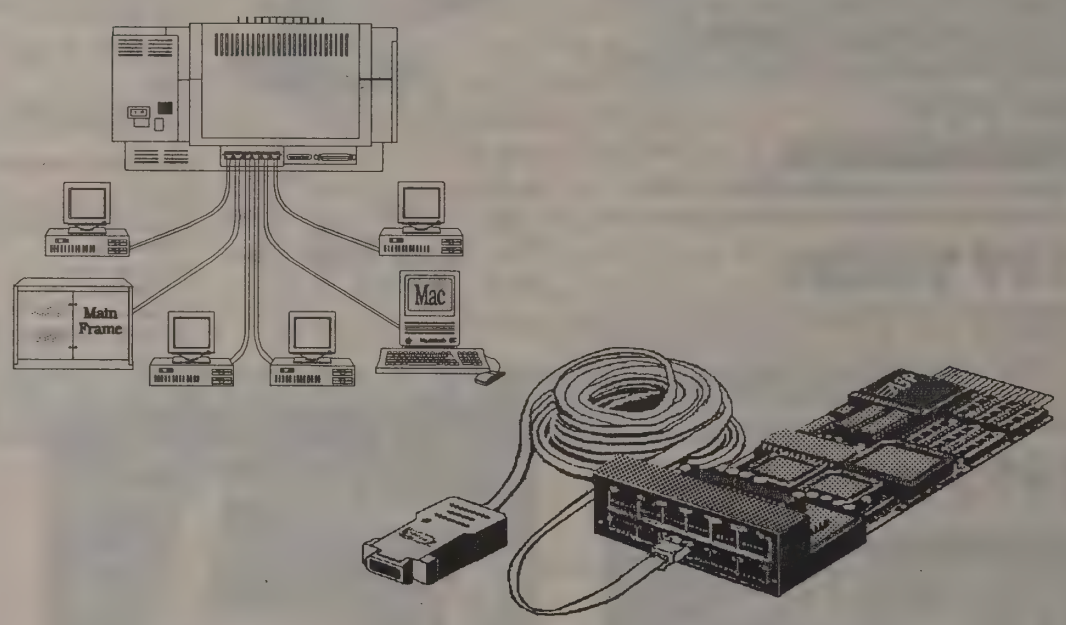

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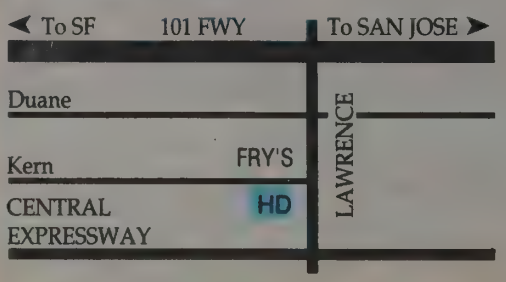

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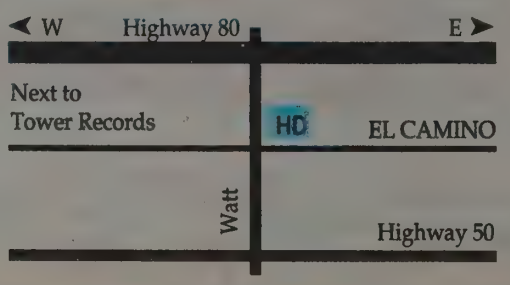

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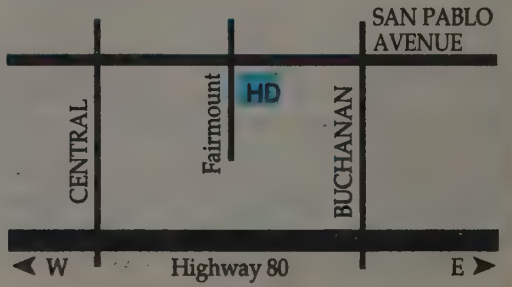

Taking the Heat out of the Hotline

Having The Information Ready And Some Patience Will Help Ensure That You Receive High-Quality Tech Support

BY MIKAEL BLAISDELL

Technical support has been a sensitive issue in the microcomputer industry for as long as there has been an industry. Everyone seems to have their favorite tale of what happened to them or to "a friend" when they called the hotline for help with a technical problem. People on the other side of the phone, in the tech support departments, also have a collection of tales concerning their callers.

There is truth at both ends of that telephone wire. Some companies do not do a satisfactory job of supporting their products, and there are people who take inappropriate advantage of the support departments. As the industry matures, support services are improving, especially since the quality of the support is becoming a strong point for market competition. Products are better designed and tested, support departments have increased their efficiency and effectiveness, and consumers have become better technically educated. But there is still a long way to go on both sides. Until market competition forces change and improvement, you're more or less stuck with the support options that exist today.

Once you have purchased a product, your main point of contact with the manufacturer is the customer support group. This is especially true for software products. (However, it is important not to overlook the help available through user groups and bulletin boards!) The majority of your interaction will be with the support representatives, and there are a number of things that you can do to take the heat out of that hotline.

The first step to take before you pick up the phone is to prepare for the call. A little work ahead of time will greatly increase your chances for rapid and effective hotline assistance. You should have your original disks and any upgrade disks close at hand. These disks usually contain important information, such as revision levels and serial numbers, that the support rep is very likely to ask for. If this information is ready, you'll save time and impress the representative. Of course, if you didn't buy the software, you shouldn't be calling the hotline.

Along with the software disks, be prepared to describe your hardware as thoroughly as you can. Many problems result from the interaction between the software and hardware, and the representative may need to ask you about specific boards and devices, etc. The more information you have available, the faster the rep can get to your particular problem. It helps to keep all of this information in a file near the computer, preferably on a single sheet of paper. If you're not very technically oriented, ask a friend to help you make a technical summary sheet for your computer.

After you have assembled all of the general information, take some time to prepare to describe the problem you are experiencing. Can you make it happen every time by doing a set sequence of actions? An accurate description of the actions and the symptoms of the problem is very important. Were there any error messages on the screen? Write them down as accurately as you can.

Once you have all of your information at hand, take a moment to make sure that you are calm and prepared. It may take some time to get through to the support rep, and patience is an important asset.

The majority of your interaction will be with the support representatives. The first step to take before you pick up the phone is to prepare for the call. A little work ahead of time will greatly increase your chances for rapid and effective hotline assistance.

Copyright © 1991 by Mikael Blaisdell. All rights reserved. *Mikael Blaisdell is a consultant to software and hardware companies regarding VAR-marketing, customer support, documentation and training issues. He is also available to in-house Help Desks, and may be reached at (415)865-1323. Electronic mail addresses are: CompuServe id: 70365,1246, or tao@WELL.*

Beginning the conversation by expressing your frustration to the representative is not a good idea, it will simply make the process take even longer. Remember, the point of your call is to get your technical problem solved, not to tell the support rep what you think about the merits of the company and/or the product itself.

The representative will probably begin the conversation by telling you his or her name, and you should immediately write it down. When asked, describe the problem as accurately as you can, and answer the rep's questions carefully. Don't worry about feeling dumb if you don't understand a technical term that the rep may use, just ask for a simpler explanation. Accuracy is very important—if you don't know the answer to a question, say so.

You'll probably be asked to perform some tasks on your computer to obtain more information for the rep. Even if you think that you know what the problem is, or that the steps you've been asked to do are useless, it's better to do them anyway. At worst, your cooperation may help the rep to eliminate some remotely possible causes for the problem so that both of you can get closer to a solution.

The representative may need to do some research before fully understanding the problem. A good support rep will give you some idea of when they expect to call you back, but keep in mind that certainty at this stage is very difficult. If you have time considerations like a deadline you have to meet, let the rep know. Before you hang up, ask the rep if there is a call number or identifier for this particular call and be sure to write it down.

Keep in mind throughout the process that you aren't the only customer that will be calling the hotline, and that others may be in worse trouble. If you are calm, courteous, and well prepared, you will improve your chances for faster service. With all of the unpleasantness that a rep's job typically includes, calm and friendly callers are a welcome event.

If you are asked to try some actions before the rep calls you back, do so, and keep accurate notes about what happens. Be patient if the call-back doesn't come in by the estimated time, and wait a bit longer before you get tempted to call again.

When the rep does call back, hopefully with the solution to the problem, don't forget a quick thank-you. If it seems that the rep has put extra energy into helping you, or gone the extra mile for you, consider writing a thank-you note to the company president with a copy to the specific representative. There will be one certain outcome to that letter—the rep will definitely remember your name if you should ever call again.

If the answer is not what you wanted to hear, calmly ask what your alternatives are or what the rep would recommend. Again, remember that whatever the problem may be, it is very unlikely to be the representative's personal fault. Save your angry reaction for a letter to the president of the company, if appropriate, don't take it out on the rep.

Problems are the most common reasons to use the hotline, but there are a variety of others. Some people seem to feel that calling the hotline a dozen times a day instead of reading the manual is perfectly appropriate, and such people quickly become very unpopular with support departments. Not only

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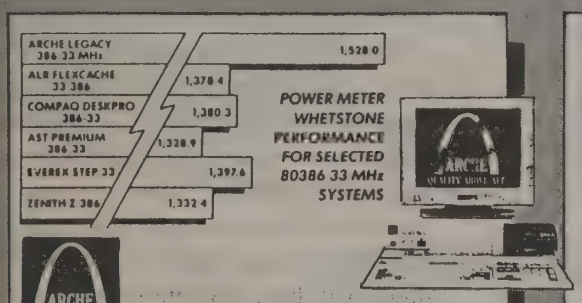
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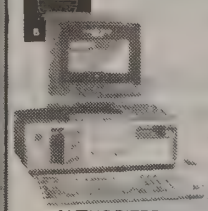

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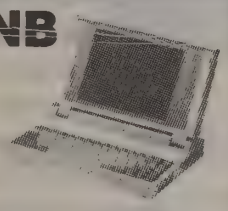

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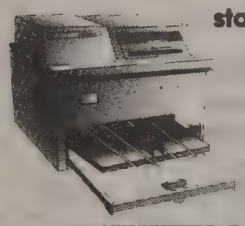

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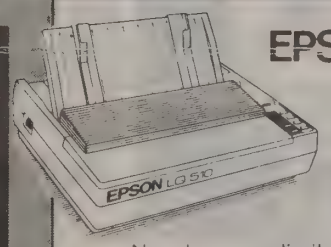

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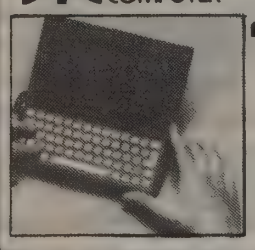

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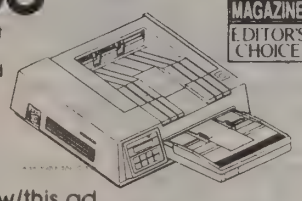

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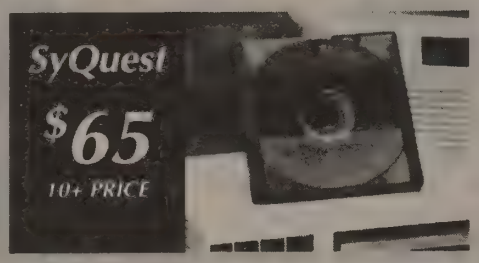

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do they take up time that may be needed for other customers with serious problems, but they wear down the rep who must answer the same question thirty times a day. Other people may call a hotline of one company only to ask about problems with another company's product. This is common with DOS or Windows-based products, where a very high percentage of the calls are operating system problems that have nothing to do with the application software. If you have a problem with DOS or Windows, call Microsoft, not the applications software company.

There are two special kinds of problem-callers that every hotline representative hates to receive, and most hotline departments have established procedures for dealing with such people. These two types make up a very tiny minority of all the calls that come in, but they require very careful handling. The first, and unfortunately all too common, type of problem-caller is the Screamer. Screamers seem to feel that the louder they scream the better the support or service they'll receive. Nothing could be farther from the truth. Policies vary from company to company, but most will permit a rep to hang up on an abusive caller who refuses to calm down. Often, the Screamer will be passed to a manager, which means that the technical problem that prompted the call is even farther away from resolution.

The second special type of problem-caller is knows at the Terrorist, someone who resorts to making threats in an attempt to force the rep to give them whatever they think they want. Terrorists will get even slower service, since the support representative has to carefully document everything that is said by both rep and caller. You might be just blowing off steam and frustration when you threaten a lawsuit, but the rep doesn't know that, and usually has been trained to immediately shift to a special procedure. As with the Screamer, the focus has moved away from the technical problem, and it will always take longer to get back to the resolution process.

Most callers are polite, helpful people who want their particular problem solved as rapidly as possible. Likewise, the great majority of customer support representatives sincerely want to help their callers as much as possible, as quickly as possible. The key to successful service is found in a cooperative working relationship between the customer and the support representative. It isn't hard to take the heat out of the hotline, and the reward will be faster and better support. Try it the next time that you call. You, and the support rep, will both be glad you did. ■

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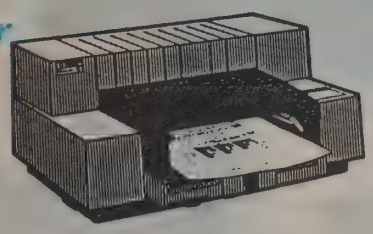

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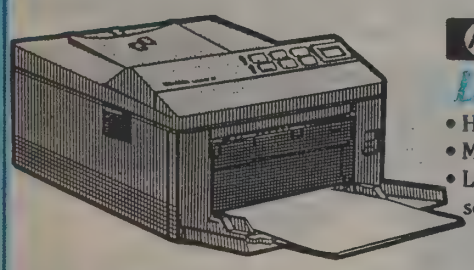

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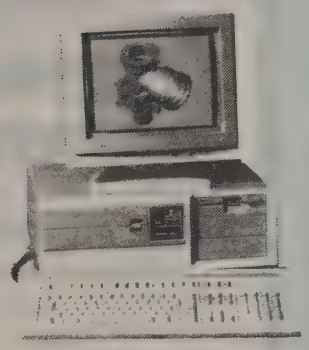

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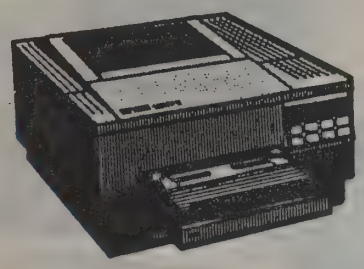

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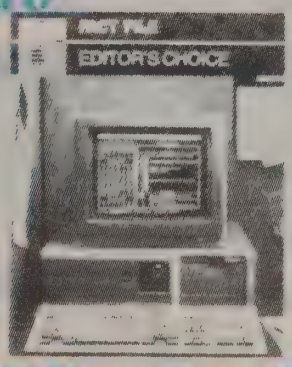

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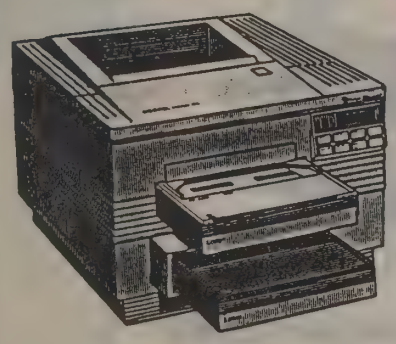

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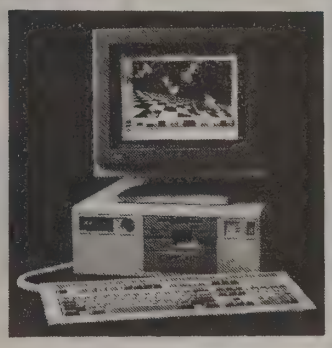

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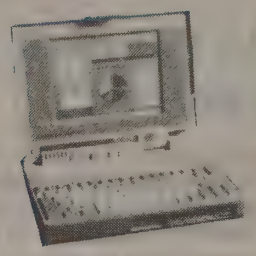

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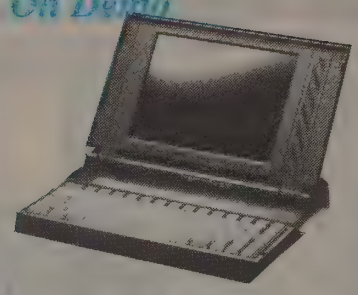

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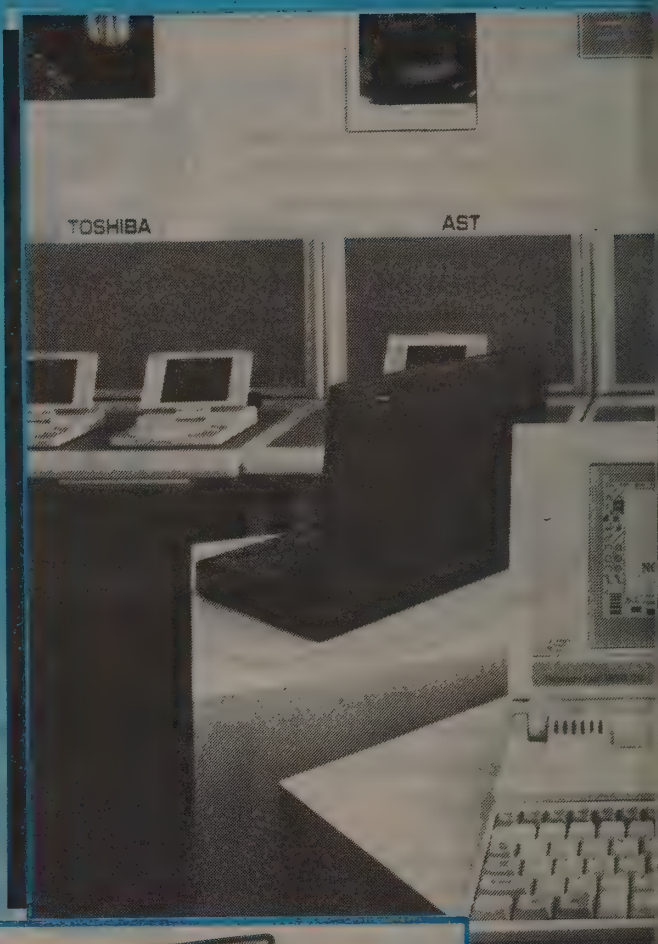

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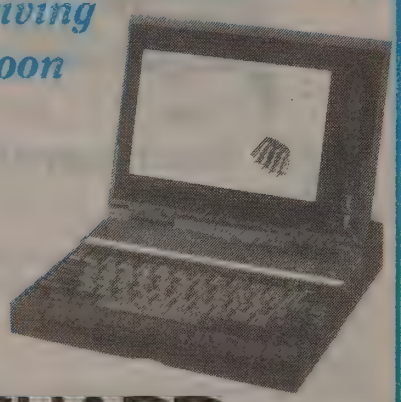

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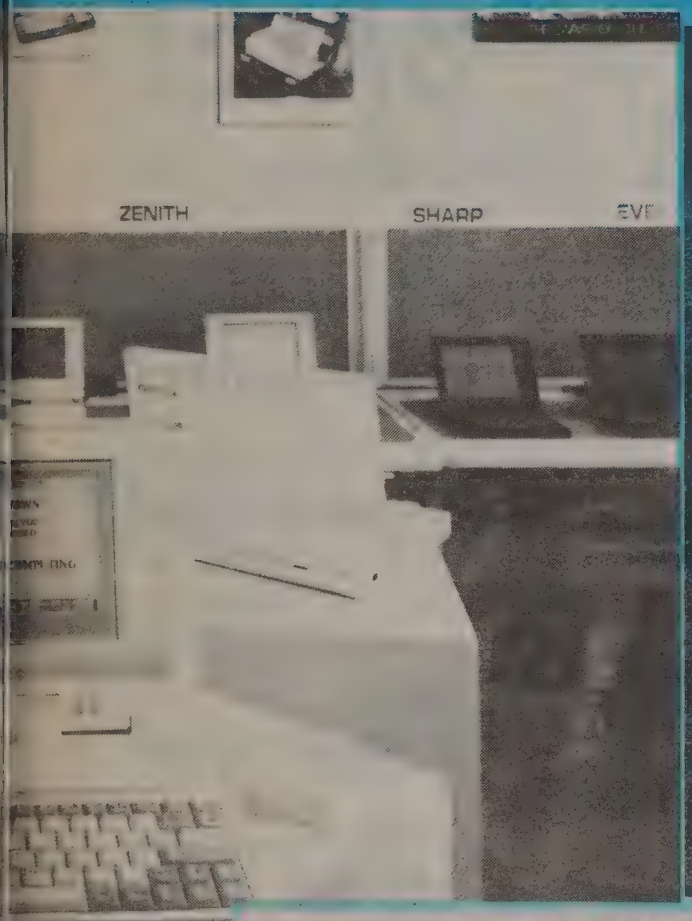

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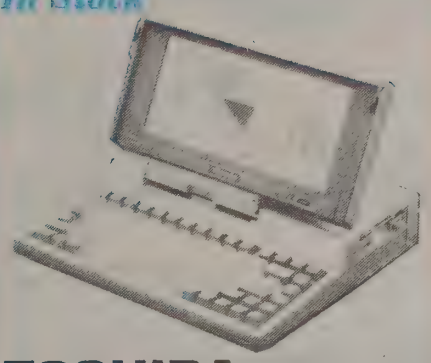

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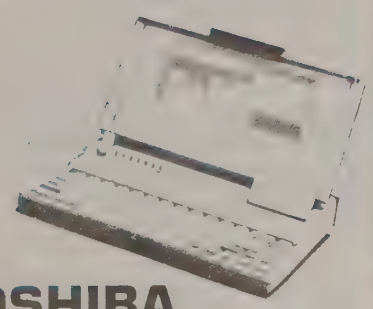

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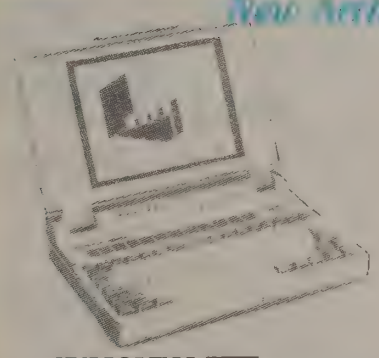

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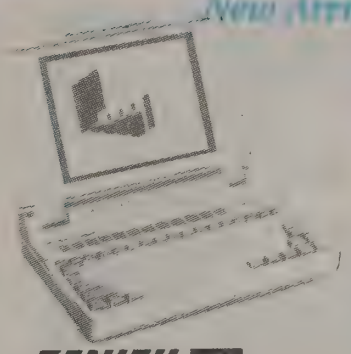

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Diogenes, Elmo, And The Hypothetical File Buffer

Metaphysical Esoterica In UNIX

BY BENNETT FALK

UNIX

A few weeks ago my puzzled friend Diogenes wandered through posing this problem:

"On a computer running Berkeley UNIX, I built two databases using a commercial database management program.

"The databases were structurally identical, each consisting of a single table, and they were populated with identical sets of data.

"The two databases were built on identical disks, and the only difference between them is that one database was constructed on a bare disk partition and the other was constructed using a single UNIX file in a filesystem mounted on a disk partition.

"The strange thing is that when queries were issued to retrieve all the rows from the two databases, the query of the UNIX file database completed in roughly one quarter of the time taken by the query of the database on the bare disk partition. Why?"

Of course, no one to whom Diogenes presented this problem could provide a definitive answer, but most voiced suspicions about the database management software.

"But there are no indices on either database," Diogenes retorted, "and the database manager's diagnostic tools reported that the two queries were optimized in exactly the same way and performed exactly the same number of disk reads."

"Oh," said the gullible, "it must be a mystery."

EXPLORING THE UNKNOWN

Those of a more skeptical frame of mind went off to verify that the two databases behaved as he claimed, and one of the more enterprising skeptics, a certain Elmo, went a step further and forsook the database software entirely hoping to prove that the whole problem was a figment of Diogenes' imagination. Elmo used the UNIX utility "dd" to read identical volumes of data from both a UNIX file and a raw disk partition:

```
dd if=database.dat of=/dev/null bs=2048 count=2048
dd if=/dev/rsd6b of=/dev/null bs=2048 count=2048
```

Copyright © 1991 by Bennett Falk. All rights reserved. *Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed are his own.*

"dd" is one of the least UNIX-like of UNIX commands. An input file is specified in an equation that begins "if="; the equation beginning "of=" declares where the output is to be sent.

For the UNIX file, Elmo inserted the name of the file that contained Diogenes' database. For the bare disk slice, he included the full pathname for the "special" file in /dev that represented the disk partition Diogenes had used. In the interest of fairness, Elmo sent the output for both commands to the "null" device.

In addition, Elmo specified a block size of 2048 bytes, and requested that dd read only 2048 blocks of this size. Finally, he used the C-shell's "time" command to print out some information about the resources used by these commands. The output of all Elmo's commands is reproduced in Table 1. Table 2 documents the fields in the "time" command's output.

To Elmo's surprise, it took twenty-two seconds to read 4MB from a raw disk partition, and only ten seconds to read the same amount of data from a UNIX file. He repeated the test and found that the time taken to read the UNIX file dropped to two seconds while the time required to read the same data from the raw partition remained exactly the same. In eliminating the database software, Elmo discovered that Diogenes' problem was certainly not imaginary, and that it had nothing to do with database managers.

Elmo knew a thing or two about UNIX. He knew, for example, that when a disk partition is used for a filesystem, the operating system creates some administrative structures on the device, and these operate in the background to let the user refer to files by name without having to know where on the disk the data in the file are stored.

Elmo also knew that UNIX provides two different interfaces for performing I/O to any disk partition. One interface allows only "raw" or character-based I/O to the disk. The other allows I/O to be per-

It took twenty-two seconds to read 4MB from a raw disk partition, and only ten seconds to read the same amount of data from a UNIX file. When the test was repeated, the time taken to read the UNIX file dropped to two seconds while the time required to read the same data from the raw partition remained exactly the same.

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formed in blocks, and it is this block interface that UNIX filesystems use.

Elmo's first test used the character I/O interface to the disk (/dev/rsd6b). The block interface for this partition is named /dev/sd6b, and when Elmo repeated the test using this name, the time required to read 4MB of data was seven seconds, not as fast as reading from a UNIX file, but appreciably faster that reading from the character device.

It dawned on Elmo that UNIX must be able to optimize I/O operations using the block interface to disk devices. Perhaps, he thought, there was some sort of buffer cache managed by the operating system to reduce the number of physical disk accesses by reading large volumes of data and retaining them in memory.

The operating system would read from disk in large blocks and store everything read in memory. At the outset, a request to read part of a file would load into the buffer cache more of the disk's contents than the user requested. Since it's very likely that the user will need to read this data as well, these further reads can be satisfied from the cache with no need for a physical disk access.

The existence of such a buffer cache would explain why the second attempt to read from a UNIX file was so much faster than the first attempt: the second time around, fewer physical disk accesses would be required, because large portions of the file were already in the file system's buffer cache.

THE STRANGE HYPOTHESIS TESTED

Elmo was uncomfortable with this much speculation, and looked for some way to prove the existence of a buffer cache for UNIX filesystems. Try as he might, he could discover no way of examining the buffer cache's contents, and reluctantly Elmo conceded that an empirical demonstration of the buffer cache's existence might not be realistic.

Elmo realized that the exact size of the buffer cache was an unknown, but since it had to exist in memory, it could certainly be no larger than the physical memory on the computer. He reasoned, if another file larger than physical memory were read, it ought to displace the previous contents of the buffer cache, and the next attempt to read data from Diogenes' database file would take longer, because fewer reads could be satisfied from the buffer cache alone.

Experimenting with this, Elmo was pleased to note that after displacing the contents of the buffer cache in this way, the next read of 4MB from Diogenes' database took approximately twelve seconds.

Finally, he noted that the time command would report the number of blocked disk reads for his commands. After purging the buffer cache, it seemed that his 4MB reads required nearly 520 disk reads. After the read had completed once, a repeat of the command required no physical disk access to return the same data to the user.

Elmo ran several more commands to test the effect of changing the block size, but these changes seemed to have no effect on how fast the reads could be completed.

THE PROPHET UNAPPRECIATED

Elmo found Diogenes posing his problem to a group of passersby, and burst in on the group explaining excitedly that the filesystem's buffer cache accounted for the behavior that puzzled Diogenes so.

Most of the people present thought Elmo was a nut. Someone asked if the buffer cache could be examined, and when Elmo responded that its existence could only be inferred from its effects, everyone groaned and ran off to follow Diogenes, who had walked off down the street, still puzzled. ■

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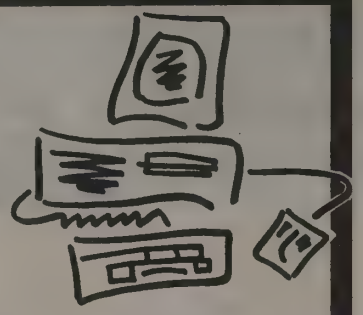

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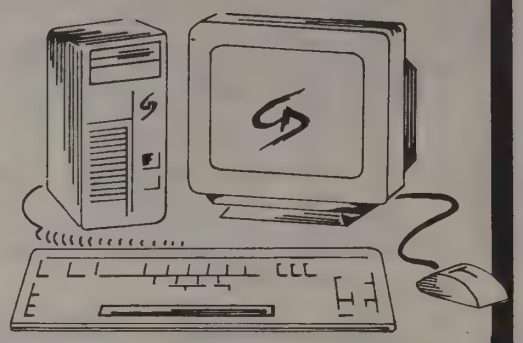

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TABLE 1

1. Read 4MB from a disk partition using the "character" interface:

```
time dd if=/dev/rsd6b of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.3u 5.9s 0:23 26% 0+88k 0+0io 0pf+0w
```

2. Repeat read of 4MB from a raw partition:

```
time dd if=/dev/rsd6b of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.3u 6.4s 0:22 30% 0+88k 0+0io 0pf+0w
```

3. Read 4MB from a disk partition using the "block" interface:

```
time dd if=/dev/sd6b of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.3u 4.6s 0:07 64% 0+80k 86+0io 86pf+0w
```

4. Repeat read of 4MB using the "block" device:

```
time dd if=/dev/sd6b of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.2u 4.3s 0:06 69% 0+80k 75+0io 75pf+0w
```

5. Read 4MB from a UNIX file:

```
time dd if=database.dat of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.4u 4.0s 0:10 40% 0+88k 515+0io 514pf+0w
```

6. Repeat read of 4MB from a UNIX file:

```
time dd if=database.dat of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.1u 2.7s 0:02 102% 0+88k 0+0io 0pf+0w
```

7. Clear out the buffer cache by reading a file larger than physical memory:

```
od a_big_file > /dev/null
```

8. Repeat read of 4MB from a UNIX file after purge of buffer cache:

```
time dd if=database.dat of=/dev/null bs=2048 count=2048
        2048+0 records in
        2048+0 records out
        0.2u 4.0s 0:11 35% 0+88k 518+0io 520pf+0w
```

9. Clear out the buffer cache and read 4MB from a UNIX file using 4K block size:

```
od a_big_file > /dev/null
time dd if=database.dat of=/dev/null bs=4096 count=1024
        1024+0 records in
        1024+0 records out
        0.0u 3.0s 0:12 24% 0+88k 519+0io 531pf+0w
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10. Clear out the buffer cache and read 4MB from a UNIX file using 16K block size:

```
od a_big_file > /dev/null
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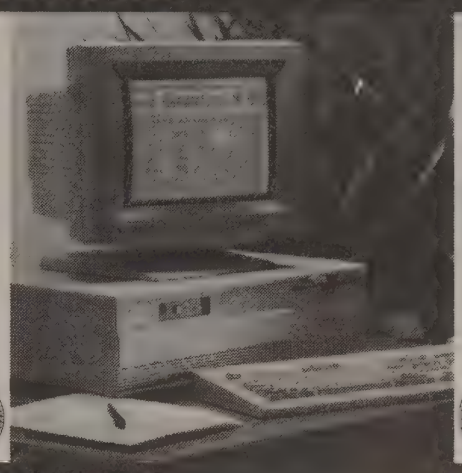

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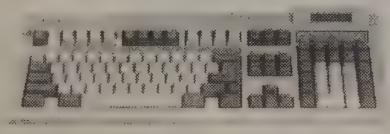

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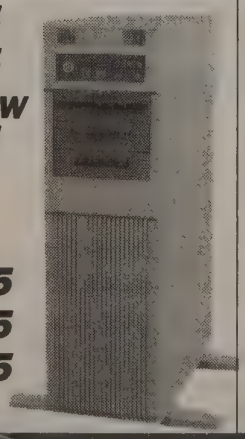

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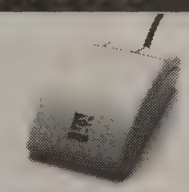

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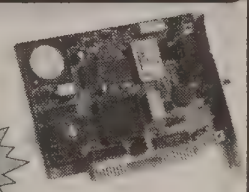

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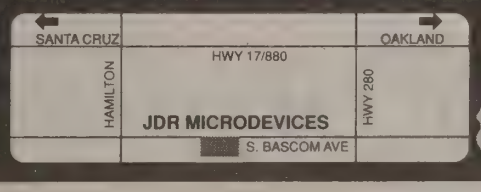

KEY CODE: 2125

```
time dd if=database.dat of=/dev/null bs=16384 count=256
        256+0 records in
        256+0 records out
        0.0u 2.4s 0:13 19% 0+88k 517+0io 523pf+0w
```

11. Clear out the buffer cache and read 4 MB from a UNIX file using 64K block size:

```
od a_big_file > /dev/null
time dd if=database.dat of=/dev/null bs=65536 count=64
        64+0 records in
        64+0 records out
        0.0u 2.2s 0:12 18% 0+112k 519+0io 527pf+0w
```

TABLE 2

Key to interpret the output of the C-shell's "time" command:

```
User time
|     System time
|     |     Elapsed time
|     |     |     CPU time as % of elapsed
|     |     |     |     Avg shared mem
|     |     |     |     |     Avg unshared data space
|     |     |     |     |     |     Block input operations (disk reads)
|     |     |     |     |     |     |     Block output operations (disk writes)
|     |     |     |     |     |     |     |     Page faults
|     |     |     |     |     |     |     |     |     Swaps
|     |     |     |     |     |     |     |     |     |
0.2u 4.2s 0:12 34% 0+64k 496+0io 503pf+0w
```


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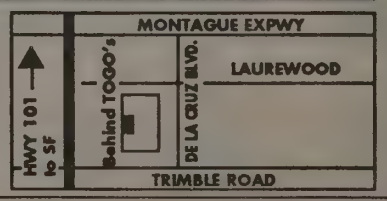

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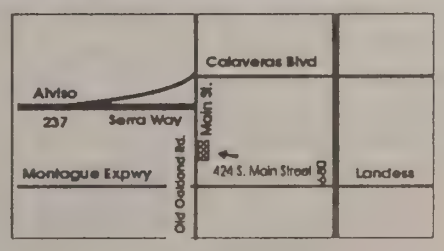
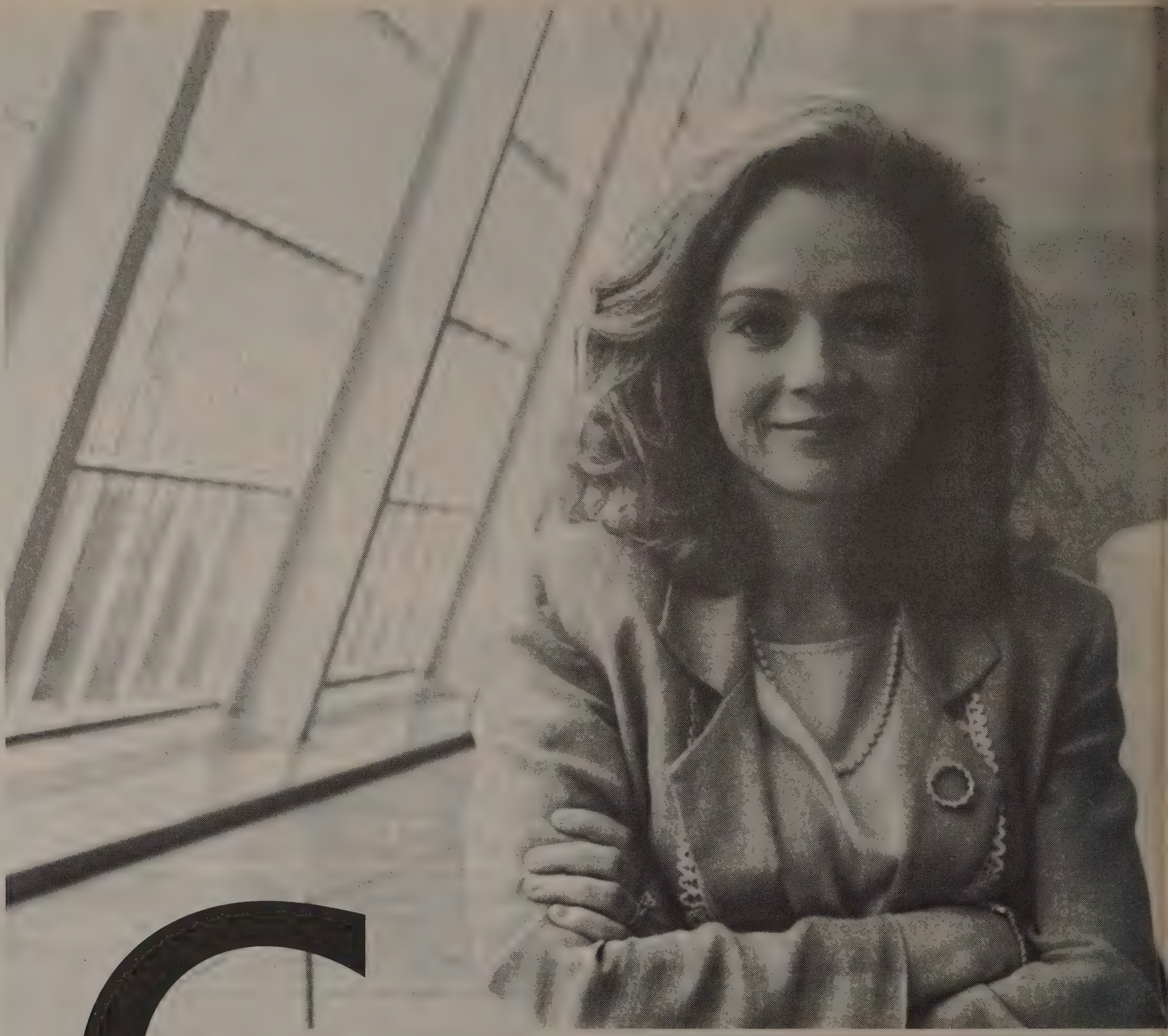
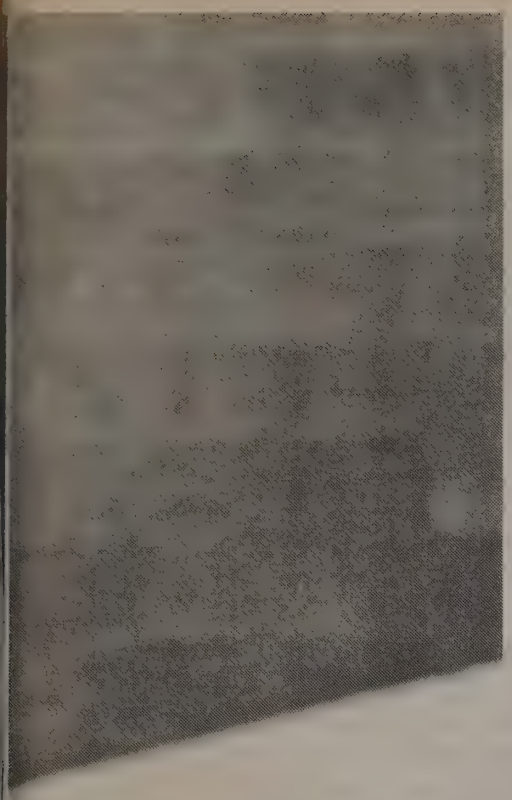




Computers & The CEO

By Mary Eisenhart
PHOTO: NDMA INC.



"Computers increase an executive's ability to think and create—that is, to do their work, not their staff's work. By using computers, executives are able to accomplish more."

—Mary E. Boone, *Leadership and the Computer*

According to Mary Boone, a partner in the management consulting firm NDMA Inc. of Ridgefield, Connecticut, "executive computing" is all too often seen as being as much of an oxymoron as "airline cuisine." This perception, she says, results in a huge, unnecessary reduction in what CEO-level and other executives are able to accomplish for their companies. By falling into the "administrative mindset," thinking that computers are something for their secretaries, clerks, and MIS departments, top-level management misses out on a key competitive advantage. "They're usually astonished when I tell them about what some of their peers are doing with computers in other organizations," Boone comments.

In her recently published book *Leadership and the Computer* (Prima, 1991, ISBN 1-55958-080-1), she interviews the CEOs of sixteen large corporations and discusses with them the different ways in which their personal use of computers has made a crucial difference to their companies. The tools differ—some swear by their spreadsheets, word processors, or electronic mail, while others don't use them at all—but in every case, they're using tools for far more sophisticated and versatile purposes than mere reading of the latest report from MIS.

Boone's a strong advocate of the work of Dr. Douglas Engelbart, whose research at Stanford Research Institute (later SRI International) during the 1960s led to the invention of the mouse, hypertext, windowing interfaces, workgroup computing, and electronic publishing. Engelbart pioneered the notion of computers as intellect-enhancing tools at a time when they were generally perceived as mere number-crunchers, and (like a lot of his other visions) this notion is only now beginning to find acceptance.

For this month's cover story, we interviewed Mary Boone about her book and executive use of computers. Following the interview, we've reproduced a chapter from *Leadership and the Computer*, detailing how William Esrey, CEO of US Sprint, used the computer to give his fledgling company an edge in the highly competitive long-distance market.

How did you come to write this book?

It was an outgrowth of our previous book, *The Information Edge* (1989). In that, I had written a chapter about executive use of computing tools. I got such a good response to that chapter that I decided that it would be good to expand it into an entire book. I found, in the course of doing that research, that there were a lot of myths associated with why executives did or did not use computers, and so I felt it was really important to explore those in more detail and get rid of some of them—because there certainly are a lot of misperceptions out there about why executives do or don't use computers.

For example?

For example, there are a lot of excuses that are given, such as "executives won't type." There are also myths about what constitutes an executive information system—a lot of people truly believe that "executive information system" equals "access to MIS data," when in fact executives are using a whole range of tools. I could give you a list of about twenty to twenty-five different tools that executives are using apart from access to data. While that's an important tool in the toolkit, unfortunately we've really been limiting ourselves by perceiving EIS to be only access to data.

In what sense is that limiting?

"Asynchronous work is a really big part of why executives like to access a computer themselves, and electronic mail plays a big role in that, because these are people that are usually all over the world, or at least all over the country."

It's very limiting because it's true that executives need to find and access certain information, but they also need to manipulate and communicate information. Those are two parts of the equation that have been left out before, because if we limit the concept to "access to data," then there are numerous ways in which we could be helping executives that we're going to be overlooking if we are biased toward one particular type of tool.

So if an executive tells you that he wants to change corporate culture, or if an executive tells you that she wants to establish a better relationship with more of her employees, then what are you going to do? Is establishing a better relationship and communicating more directly with employees going to lead you to "access to data"? Well, maybe or maybe not.

And if we're biased going into it, again, we're not going to be open to a whole broad range. Likewise, we can't be biased *against* access to data. It's one tool in a very broad toolkit that we have available to help executives.

What did you find were the most significant non-access-to-data tools that executives were using?

Definitely electronic mail is very important.

It did seem to be a recurring theme in the book.

It comes up quite frequently. I don't know if you noticed the notion of asynchronous work...

Yes. I use email a lot too; it's the main way I communicate with my writers, some of whom I've never met and have been working with for years.

Right. There's a wonderful quote by Robert Wallace [former president of Phillips 66] about how he initially did not want to use electronic mail, because he didn't type, and how he overcame that barrier of typing. He discusses the fact that he didn't want electronic mail, but he consented to it because it had scheduling on it. He used to dictate his responses to his secretary, but finally he got so dependent on the functionality that he started typing with two fingers and punching out replies; because he found that the value of being able to work asynchronously and get things accomplished in his own time frame far made up for the inconvenience of typing.

Asynchronous work is a really big part of why executives like to access a computer themselves, and electronic mail plays a big role in that, because these are people that are usually all over the world, or at least all over the country. To be able to maintain contact with the people that report to them, and with other people at other levels of the organization—that's another mention that they make, of being able to flatten the hierarchy by more people having access to them directly. They really find electronic mail to be useful.

As for other tools, it really varies a lot according to the executive—some of them will say, "I just love the word processor; it really helps me to be clear and direct in my thinking," and others will say, "I don't use it at all." Some will say, "The outline editor really helps me develop a hierarchy of ideas," and others don't even know what an outline editor is.

So when I say "electronic mail," I don't want to give the impression that every executive needs electronic mail, either. It's a highly individual type of approach, which is why I think both vendors and IS people need to be aware that we need to have the broadest toolkit we possibly can have in order to be able to be flexible for those kinds of individual needs and applications.

There's also a tendency in some quarters to see computers as a panacea.

Exactly. I think that's a very big problem. I think there's been a lot of overselling of computers and strategic value. I believe that people equate strategic value with extremely large, complicated, expensive systems, and see it only as connections between customers and suppliers, and in fact that's been one of the problems in the industry. This whole panacea problem comes up due to a lack of focus.

This gets back to what I said before about the unique needs of executives. We can't go in promising, with an executive information system, that we're going to be able to solve all an executive's problems. That's just absolutely not true, and it would be ridiculous for us to put ourselves in that bind. But we can go in and use the kind of structured interview approach that I describe in the book, which is a highly focused way of finding a very highly leveraged application for an executive that can be implemented in the near term.

There are ways in which we can help executives have tremendous leverage by biting off a smaller chunk of change, if you will—not trying to change everything at once, but trying to set priorities at every level in the interview and make sure that we are helping the executive with his or her most important and most vital objectives and goals. What I say, going into the interview with an executive—I'm very clear on this point—is, "I'm not here, or able, to solve all your problems like a magician. What I'm here to do is really try to understand what it is you're trying to get accomplished and see if there's some ways in which we can help leverage your effort to get what you want to get done."

Are you yourselves systems providers?

No, not at all. We provide no software and we do no vendor recommendations. We only focus on the management issues, as opposed to any technological issues.

Do you see any particular breakdown as to who's using mainframes, who's using minis, who's using PCs?

It's hard to extrapolate because I had such a small sample. Working with sixteen case studies, I'm trying to be very careful about not making projections. But there is a lot of use of personal computers among my sample. Very few terminals to the mainframe; I would say probably less than a quarter of them had that kind of setup.

Can you speculate as to why that might be?

It would be hard to speculate.

It wouldn't be interface issues, for instance?

No, I don't think that's it. I think it's probably more popular press, and seeing what's going on, and wanting to be able to do some of the kinds of things that they've read about.

Are there situations where the computer is not an appropriate tool?

Absolutely. One of the things that I mention to executives when I do interviews with them is that I say, "We may or may not come up with a computer tool, and you have to be absolutely willing to walk away from it if a computing tool is not appropriate to solve the particular problem."

If what you need is a fax machine, what you need is a fax machine.

Right. Exactly. And I'm always looking for that least common denominator. I'm always looking for how we can do the most with the least amount of investment. That's what we're always looking for, for that cost/benefit equation to be very heavy on

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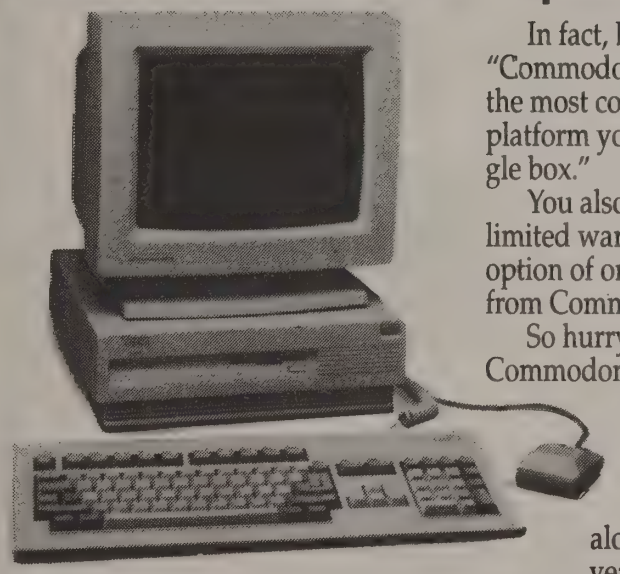

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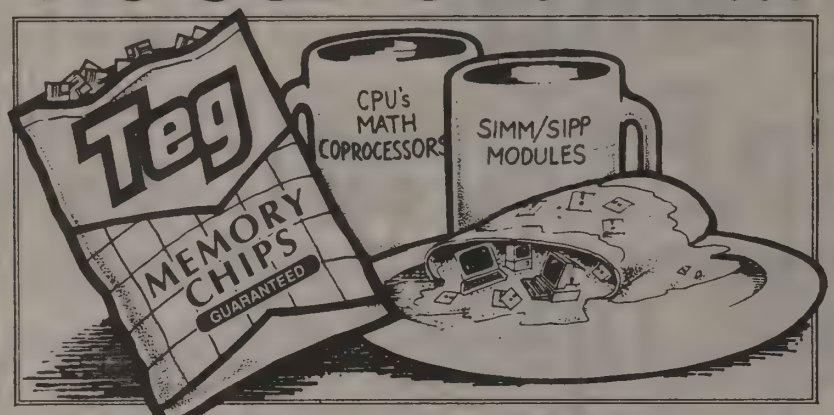

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the benefit side and very low on the cost side.

There are many problems that executives have that computers won't solve, or won't help with, but I think executives to this point have believed that the computer is an administrative tool, as opposed to an intellectual tool, and therefore they focus too much on that side of the equation. They focus too much on saying, "Computers aren't for me. They're for my secretaries and clerks." It's because they simply have no idea of what a computer can do. They're usually astonished when I tell them about what some of their peers are doing with computers in other organizations.

A lot of what are called strategic applications and EDI and those sorts of things, while they're very important and good for corporations, are still focused in large measure on that administrative side. There's been very little intensive focus on how computers help grow the human mind.

I noticed that you quoted Doug Engelbart early on, and I said "Aha! this is going to be a smart book..."

(laughs) That's right. I'm definitely a Doug Engelbart fan, a diehard Engelbart fan, because I really believe he had these ideas I'm talking about a long time ago. Dean Meyer, my partner, worked with Doug; he was at SRI with Doug back in the early '70s. Dean's ties to Doug are very strong, and it's had a tremendous influence on my own ideas and beliefs.

Have you found that MIS departments are apprehensive about executives getting independent-minded with their computers?

I think they're worried about the whole notion of executive computing for several reasons, one of which is they're concerned about failing, which is a legitimate concern in the executive suite, because of course it is very high-visibility, and politically it's kind of a hot potato. So they have a lot of concerns about doing it right, which I think are good.

I also think, though, that they've been a little reluctant to get started and have kind of used the fact that they're looking for the perfect system as an excuse to stall. Or used something like "We've got to get all our data correct before we do something" as a reason to stall, because of those fears and concerns about helping in the executive suite.

I think the tide is turning, though. I think they're now recognizing that there are a lot of ways that this can be extremely critical and important to the corporation, as well as helping them to establish a better relationship with their CEOs, because the CEO will come to understand computers in a different way if they do have a success in the executive suite.

So while I would say that yes, maybe there was some hesitancy before, I find that that is really changing into much more curiosity and much more of a desire to be proactive at this point. Because if they're not proactive, I think they're starting to see that the executive may get out ahead of them, and they may lose a real opportunity.

One recurring theme in the book seems to be that the computer is a particularly useful tool for growing companies. You start in the garage, and everything's fine because you can walk down the hall and know everybody. You

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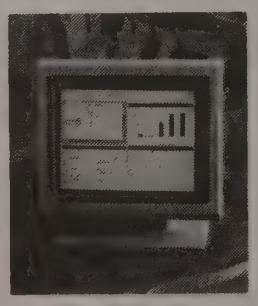

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"I think people are becoming less phobic and more frustrated. I don't think now that people's lack of use of computers is so much based on their fears as it is on their lack of understanding of what the computer can do for them."

have a level of control there that you don't have when you have three regional offices. What issues arise as a company grows that make the computer more crucial?

It helps them stay connected, even though they're gaining in terms of numbers of locations and numbers of employees. But I also think, with executives who have experience using computers themselves, that as their companies grow, they start to see how computers could be applied to help their companies grow in even faster and better ways. In other words, they gain more sophistication and knowledge and understanding of what the computer can do, and therefore they can apply that to helping their companies grow in more positive ways.

I do want to get back to something about electronic mail. Even at our site—we're a very small company, one location—we find electronic mail critical. It goes back to the whole asynchronous work issue.

It's too hard to get everybody together in a room.

Right. Also, it takes it out of your mental scratch pad, if you will. You can only hold something there so long, and you either remember to tell somebody about it or you don't. I find that having electronic mail is so wonderful, because if I just think of something off the top of my head, or have a flash or an idea or an insight, I can just pop it right into electronic mail and know that I'm not going to forget to tell that person. Whereas if I had to get up, write a note, go down the hall, or go next door to do it, I might tend to put it off, and there would be a higher probability that I would lose that thought. So it has other implications that are less apparent.

The flip side of the computer-using executive is the computer-using staff, some of whom are every bit as phobic about it as some of the executives are. How much of a problem is computer phobia in the workforce? Obviously, if the executive is sending email, it's only useful to the people who can send him email back.

Right. That's definitely true.

I think people are becoming less phobic and more frustrated. I don't think now that people's lack of use of computers is so much based on their fears as it is on their lack of understanding of what the computer can do for them. There's so much out there now. If you pick up *PC Magazine*, you think, "My God, what am *I* supposed to do with a computer?" It's very hard to pick just what software or what applications are right for what you're doing. It's a big investment of time, they've got to learn how to use it. And they are really frustrated about not knowing what's appropriate for them.

That's why I feel that this translation process, this establishment of a connection between work and computing, is so critical. That's what I feel IS people need to be doing, working really hard to help people start to make those connections. Through an interview process, to help them do that connecting, and to pass on that type of knowledge, so that people can really selectively learn how to use a computer.

I think it's not fear of failure, it's just information overload. They don't know what tools will help which of their business problems, that will make their use of their time leveraged and beneficial.

Have you noticed any particular geographical distinction? Obviously out here in Silicon Valley there's probably a pretty high percentage of executives who use computers....

Probably so, but it was a real shock to me how many don't. When I first started doing this research, I had a list of 100 CEOs who purportedly use computers. When I started calling them, I found out that indeed they had computers, but they didn't turn them on. Or they were looking up a stock here and there. Something really, really trivial.

I do think there's probably a higher preponderance of use somewhere like the Silicon Valley, or Cambridge and Boston. I think that while there are geographical differences, there are always the exceptions to the rule that are kind of shocking—some people that are information systems vendors aren't

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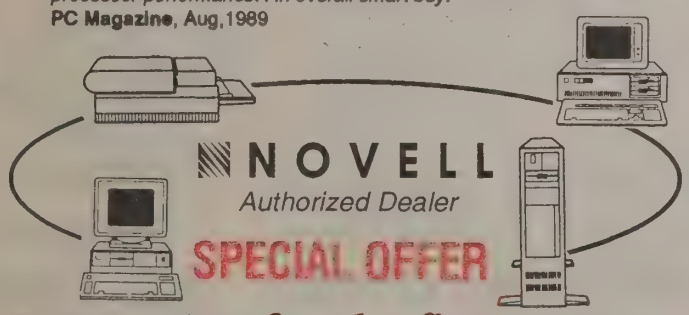

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'When I first started doing this research, I had a list of 100 CEOs who purportedly use computers. When I started calling them, I found out that indeed they had computers, but they didn't turn them on. Or they were looking up a stock here and there. Something really, really trivial."

even using computers.

So while there may be some geographical distinction, I think, again, it's like some of the other things we assume—we assume maybe it's because of age, or whatever differences there are. It really varies from individual to individual, how intellectually curious they are. I think that has more to do with it than either geography or chronological age.

If an executive's sitting there reading some computer magazine and thinking that the world is passing his company by, and that he better get his company online but isn't sure how to proceed, what should he be asking?

If I were a CEO, and I were curious about all of this and wondering how to get started, the first thing that I would do is discuss my concerns and interests with the person who's head of the information systems area, and explain to them exactly what I'm curious about and how I want to approach it.

It's very important that the person the executives get to help them has two kinds of expertise: expertise in the business, and expertise in translating those business objectives into a whole variety of potential tools. So what that person needs to be, essentially, is a technology generalist. They don't need to be a specialist, they need to be a generalist.

And then that person can help them set priorities, understand what their priorities are at each level, and ultimately help them determine whether or not a particular tool will be appropriate. Because if they don't go through that needs assessment process up front very carefully, they're likely to become extremely frustrated. They may just serendipitously drop into the right applications, but I would suggest that they take a look at that needs assessment process, and at least understand it, to know what they should be expecting of the person who's coming in to ask them about their computing needs.

Is this necessarily going to be a big expensive proposition? Because some companies are small, and they're looking at this as a major expenditure. But while some of the companies you discuss in the book are quite large, some of them didn't necessarily have huge budgets for this sort of thing initially.

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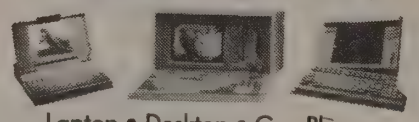

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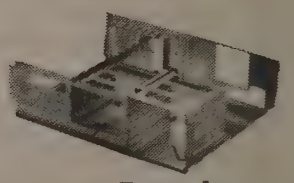

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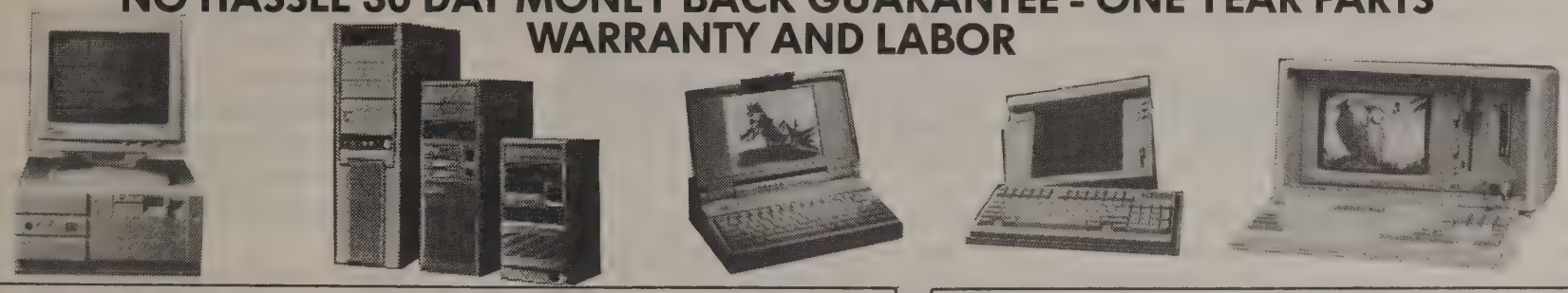

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problem. If you can't solve the whole problem, you can learn how to take a critical part of it and solve that part of it. The old 80/20 rule applies, where you can get 80% of the benefit for 20% of the cost. While there are some solutions that may necessarily be larger problems and might require larger solutions, there's absolutely no reason why a person who's working with you can't learn to work within your budget and still deliver significant value to you, even if you don't have the budget of a mega-corporation.

In your opinion, does interface make a difference? Is a Windows or Macintosh environment more conducive to getting a lot done?

It's a myth that the user interface has to be extremely easy to use. Again, as Engelbart says, there's a tradeoff between functionality and ease of use. There necessarily is a tradeoff, there's just no question about it. I like to make the analogy of "Are you going to ask a Formula 1 driver to take a Chevrolet Caprice out on the track because it's easier to drive?"

No. But that doesn't mean that ease of use is not an issue. I think that what we need to do is find the easiest interface that's possible for the level of performance that you're expecting. Executives will overcome unbelievable interface problems if they see that it's going to really deliver some value to them.

That's no reason to put obstacles in their way; if there are ways to deliver the same functionality with an easier interface, certainly we want to do that. But let's not get too focused on the ease-of-use issue and lose sight of the functionality issue, because I think a lot of research money and a lot of vendor effort has been put into making things easier to use, and they've lost some opportunities to come up with applications that are focused more on extending people's thinking abilities.

So I'd like to see us continue to make it as easy as possible without sacrificing the functionality.

One of the things that executives said to me was that they were less concerned about whether it was easy to use in the sense that it was easy to learn than they were that it be easy to remember. Because what's frustrating to them is if they use a tool, and then don't use it for two weeks, and then come back and can't remember how to use it.

They don't mind making the up-front investment, as long as it's intuitive enough, once they've learned it and incorporated it, that down the road they can remember it. A perfect example is something like Augment, software that Doug Engelbart developed. I use that myself all the time, and I was just furious at how hard it was to learn at first. Now I won't switch to any other computer that I can't run Augment on.

What does it run on?

Actually it's not commercially available. We've been using it on our local area network on IBM PCs—we've got a mini-version of it. It was not easy to learn, but it's incredibly easy to use once you know how to use it. Then you can move at the speed of thought. You move so quickly that you can't imagine going back. I can't even think of using anything else as an outline editor or a word processor. It's just impossible—I can work three or four times faster than most people.

I think that's what executives are trying to get to. They don't mind investing up front to learn how to use it, as long as, once they've made that initial up-front investment, it is easy to remember and intuitive from that point on.

How significant at this point are non-text tools, like video and mulitmedia?

I found that a lot of these people had video tape recorders in their offices, and they were using videotape as a means of getting some objectives accomplished.

In terms of "multimedia systems," I didn't find a lot of use of that. That doesn't mean that there won't be applications. Again, it's another issue of being like a kid in a candy store, and you don't know what really matches your budget or your taste. That's why it's so important to take those objectives up front and then do that translation process. Somebody who understands that process can say, "Hey! If this is what your objective is, and this is what you've got to do to get it accomplished, I've got an idea that this multimedia tool might be able to help you."

We tend, as an industry, to be very technology-driven and come up with all these wonderful tools, but we don't do our homework on the other end. It's great to have the creativity and have the new technologies, and I hope the people that develop them continue to do that, but we need those translation people to help us understand how the tools will be critical to expanding our minds and accomplishing our objectives. ■

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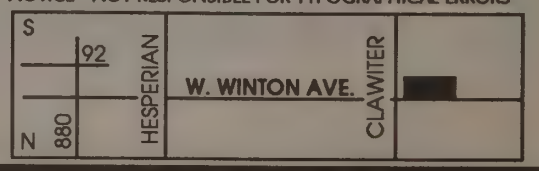

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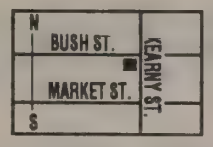

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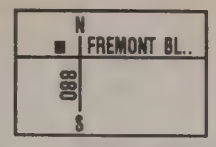

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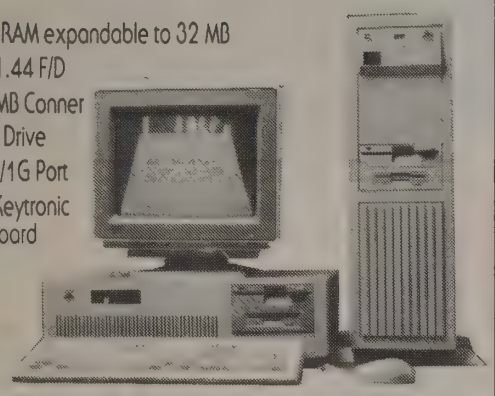

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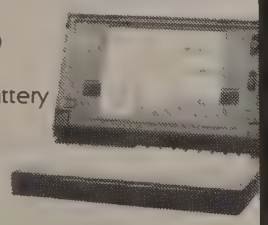

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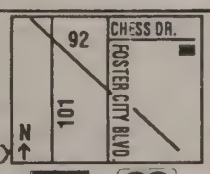

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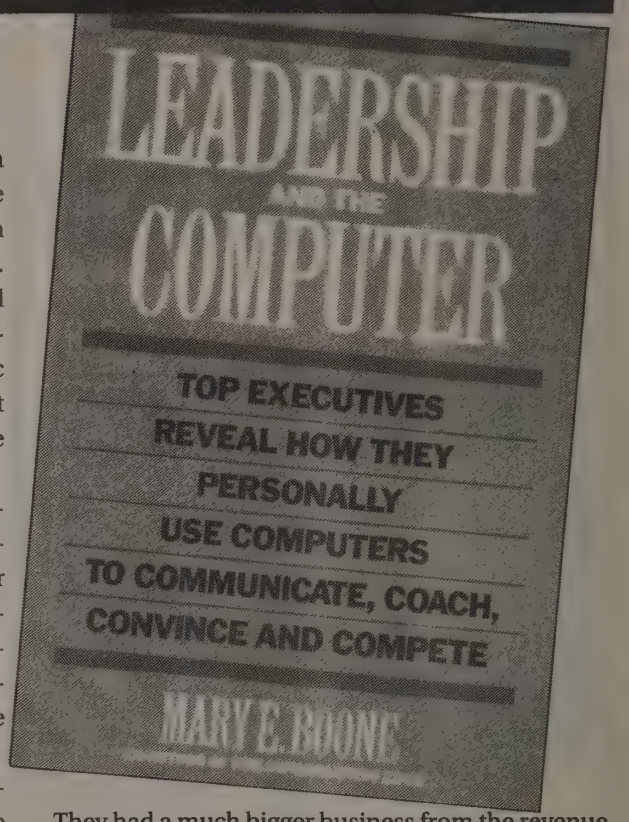

Something interesting hangs on the wall of Bill Esrey's office at US Sprint. It's a crumpled scrap of paper that has been smoothed and framed. The message, addressed to the then United Telecom chairman, Paul Henson, was scribbled by Esrey while standing in a Colorado telephone booth:

PHH

Rocky agreed!

WTE

Though its aesthetic appeal is questionable, there's little doubt that this scrap of paper represents what is in many ways a work of art: the moment when "Rocky" Johnson, chairman of GTE, verbally agreed (over the phone, of course) to let United Telecom have a controlling interest in US Sprint. This represents a milestone in a complex story that began some years earlier.

When Esrey came to United Telecom in 1980, plans were being made to move into the long-distance market, even though the breakup of AT&T was not yet complete. Given the "David and Goliath" nature of United Telecom's position relative to AT&T, the management team knew it would need a distinct strategic advantage. In 1983, the board and management agreed that a fiber-optic network would be the mainstay of the company's competitive thrust.

"We started off in early 1984 with nothing," remembers Esrey. "We had only a handful of employees who were going to build this network, and fiber was in very short supply at the time. We had no right-of-way. We didn't have the total financial wherewithal. So we committed to the board to find a financial partner because the risks were awfully large relative to the size of the company."

As the search of a partner proceeded, United Telecom continued to invest. The venture began to take longer than expected, and it was losing lots of money. Amazingly, the board stuck with the plan. "The downswing was deeper and more sustained than we had estimated," says Esrey. "Luckily, we really had good, open communications with an outstanding board."

Hanging onto a long-term vision isn't easy: "An article in the *New York Times* said, 'They have to be bluffing. They have no intention of doing that; they're just trying to keep others at bay.'

"There was a lot of dissention within the company, particularly from the profitable [local telephone company] side of the business. They kept saying, 'What are these people doing? We're making all the money, and they're losing it over there!'

"There was a lot of skepticism. But all those challenges were what made it exciting and what motivated people. You could come in here on a Saturday or Sunday afternoon, and you would find all kinds of people working feverishly. They were working hard, not because of deadlines, but because they all felt part of accomplishing something that nobody had ever tried to do."

Meanwhile, the search for a financial partner continued, and in 1986 a fifty-fifty partnership was put together between United Telecom and General Telephone & Electronics Corporation (GTE). "GTE had experience, market presence, and penetration. They had a much bigger business from the revenue point of view. What we had was the network strategy—the competitive advantage." Thus, US Sprint was born.

"You had an organization that was coming together from all over," Esrey explains. "GTE Sprint was headquartered in California; Telenet in Reston, Virginia; US Telecom in Kansas City; and GTE in Stamford, Connecticut. It was such a fast-moving business, and communications were critical." Decisions had to be made quickly, and Esrey is not one to let distance slow him down. "[The need for] rapidly moving information and being able to get together in one way or another to make decisions really caused us to rely on [information technology]."

The executives used a combination of video teleconferencing and electronic mail to stay in touch and make timely decisions. "The telephone would have been adequate for accomplishing this, but I just don't think it would have been as effective as teleconferencing and electronic mail. Videoconferencing provided a different dimension. It helps build relationships when you can see people. Electronic mail provided for the separation of time sensitivity."

As the company came together, there were still doubts about its viability. "All during this time, I kept asking myself if we were doing the right thing," admits Esrey. "What people saw from the outside at

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US Sprint CEO William Esrey: "I think people do things in e-mail that they might not do in a memo. You get a lot of 'Gee, I just picked this up,' or 'I just talked to so-and-so.' You probably wouldn't get a memo or a report on those kinds of things. It facilitates the general flow of information."

any given time was not a pretty picture. We didn't expect to go through times where we didn't earn our dividend. We didn't expect to actually lose money. But we rode it through."

In 1988, GTE decided it had had enough of a ride. It had taken extensive losses and write-offs in the long-distance business. Soon after the Colorado phone-booth negotiation between Esrey and GTE chairman "Rocky" Johnson, United Telecom took over an 80 percent interest in US Sprint.

At the time, people thought GTE had gotten out just under the wire. But the picture changed abruptly. US Sprint's turnaround in the last half of 1988 astonished onlookers, including Wall Street. The stock zoomed up over 100 percent. That same year, Esrey added to his CEO responsibilities at United Telecom by also taking on the same role at US Sprint.

The uncertain childhood of US Sprint was over, but now it was moving into a feisty adolescence. As Esrey took over the reins at Sprint, he found an abundance of energy and activity, but a clear need for focus.

FOCUSING A YOUNG COMPANY

As an avid athlete, Esrey is always aiming for the next big challenge. This attitude extends to his business career, as evidenced by his decision to take on the US Sprint presidency: "When I decided to go over as president of US Sprint, people said, 'Why?' The Board asked me, 'Why in the world would you want to do that? We've gone through two presidents over there. It's a rat's nest. We don't want you to get tangled up in all of that.'

"But from my point of view, that was where the potential was for the shareholders. And we're in business to make money for our shareholders. Ultimately, it was my responsibility."

To meet the challenges of another corporate helm, Esrey had to manage in two places at once. United Telecom and US Sprint had separate headquarters offices. "The logistics of trying to be in both places at once became very difficult...even though Sprint is only three or four miles away. Where's your secretary? Where are your phone messages? Where's your calendar? Where are your notes? I mean, you're not going to pick up boxes every time you go back and forth each day. Information tools really became essential at that time. They really began to help me personally."

In addition to heading up two locations, Esrey found himself taking on the management of a new type of corporate culture. He had to lead a young company into maturity. His position at the helm of US Sprint required distinctly different leadership skills from his position at United Telecom: "United is a fairly predictable, stable culture. They have procedures down pat; fewer decisions need to be made. It's a big, successful operation that has figured out how to do things, and that's the way they're done.

"Sprint is sort of like a racehorse that's running around, changing rapidly. The growth is explosive. There are a lot of new people, many of whom we say we've given 'battlefield promotions.' They've got five decisions to make today, and they'd better make them today because there are five more tomorrow."

In such a fast-paced environment, people tend to lose direction. "We had a lot of people who would go home tired after 16 hours of working intensely all day, but they spun their wheels and nothing got done. They weren't working on the right priorities; they didn't have a clear-cut idea of where they had to go, what the vision was, and what they had to do to achieve it."

Esrey needed to get people focused, and he found information tools were able to help him achieve that goal. "You can drive a lot of effects with these systems," says Esrey. One step he took was to have the cash figures put on his system every day. It was an important signal, letting people know the importance of cash. "It's useful in terms of setting priorities."

Access to internal information continues to help Esrey focus people by prompting him to ask the right questions: "For my next staff meeting at Sprint, I have a number of things I want to ask people about. I get the information off the system, make copies and notes, and use them to find out if people are still keeping their priorities straight. The system is a great thing. I can look and see how we're doing; and I can see that we're doing great on these twenty-three things and, on these four, we're going the wrong direction. Then I can ask people about those [four specific issues] in the meeting."

Esrey's operating information is set up in a hierarchical way, so he is able to get varying levels of detail. The name, phone number, and electronic mail address of the person who compiles the information is available on the system; if Esrey wants more detail or has a question, he can contact that person directly.

He is surprised at the impacts of calling those contact people. "I just recently started calling them. There have been some surprises. It starts to change the culture. It pushes things down in the organization to the people who really know, and lets them know that management is aware of what's going on and that we haven't lost touch."

Besides making people aware of areas of management's interest, there are other ways of focusing people on what's important. One way is rewarding them for work well done. "The system also helps you be more inspirational. It gives employees confidence when they know you care about what they're working on."

He provided an example of the motivational impacts: "I saw a guy in the fitness center here the other day. He works at Sprint, and [on the computer] I just happened to have been looking at some of the things he's been doing. I said to him, 'Hey, Tom, I see we're really making progress on your porject.' Well, you know, he starts thinking, 'Hey, what I'm doing is important; somebody cares about it. Somebody's interested in it.' You can relate a lot better to what people are doing."

Other tools serve Esrey in his efforts to continue to guide the maturing Sprint culture:

"We also use our DEC electronic-mail system a lot to comment on issues that we really want people to focus on. I can flip through information and then fire off questions, responses, and comments through electronic mail, without the need for extensive meetings. In a couple of minutes' time, I can talk to ten people on five different issues.

"Electronic mail helps me to focus people on the issues that I consider important. They set their priorities by what I respond to. If I keep harping on the same issues, it sends a pretty clear message about what is important. If someone sends me an e-mail message on a bunch of issues and I consistently respond to a selected few, it doesn't take a rocket scientist to figure out that those selected issues are the ones which really have my attention."

Esrey believes that the way he uses electronic mail differs from the way he uses a paper memorandum:

"In many cases, electronic mail is more of a dialogue. I think people do things in e-mail that they might not do in a memo. A memo is more like a formal report. E-mail can be both formal and informal. You get a lot of 'Gee, I just picked this up,' or 'I just talked to so-and-so.' You probably wouldn't get a memo or a report on those kinds of things. It facilitates the general flow of information.

"There is a difference in the type of communication. I can tell that the people who send me electronic mail feel that they are dealing directly with me. They are sending it to my machine, and they know I am going to read it. They treat it differently from sending a letter that is going to be screened by a secretary."

BALANCING INTERNAL AND EXTERNAL ATTENTION

In a new corporate culture, people are often more concerned with internal, as opposed to external, activities. In the early stages of growth, people tend to fight internal fires and establish their territories—rather than think about what is going on in their marketplace or the outside world. In tandem with his efforts to focus people on the correct internal issues at Sprint, Esrey wanted to create a broader awareness of activities outside the company. He notes that companies cannot move into a top market slot without knowledge of what competitors are

Continued on page 214

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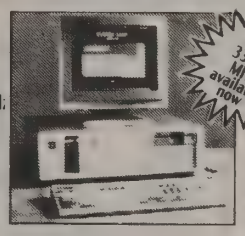

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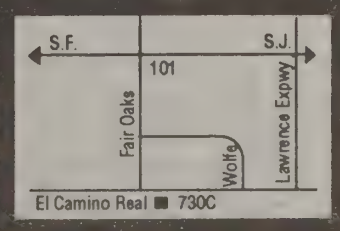

DTK NEWS

(Paid Advertisement)

DTK GROWTH SPURS MOVE TO LARGER USA-HQ OFFICE

Strong sales growth has caused value-leader DTK Computer Inc. to move its headquarters into larger facilities for the second time in four years.

DTK's U.S. headquarters operations moved March 30th to new facilities in the City of Industry at 17700 Castleton Street, according to Thomas F. Bayens, Director of Marketing. The new offices are more than double the previous size.

Western Regional headquarters plans to move to a different location nearby when construction is completed in a few weeks. Regional headquarters serves the states of California, Oregon, Washington, Nevada, Idaho, Montana, Arizona, and Wyoming, Utah, and Western Canada.

DTK ADDS R&D FUNCTION TO SAN JOSE OFFICE

DTK Computer Inc. will soon add an R&D (Research and Development) function to its Northern California office in San Jose, according to Rany H.T. Hsieh, Vice President and General Manager.

"We want to work closely with our major suppliers, and many of them are in the Silicon Valley," said Hsieh.

Founded in 1981, DTK is one of the world's largest independent manufacturers of motherboards and add-on cards. More than 100 engineers and technicians are involved in the company's R&D operations.

DTK manufactures and markets a full line of Industry Standard Architecture (ISA) microcomputers, motherboards, and add-on cards, selling its products through independent distributors and resellers.

HOT-TO-TROT!

DTK 386SX/20MHz

Model PEER-2030 Bare Bone System

✔ *MAINBOARD*	DTK PPM-2030C
✔ *MICROPROCESSOR*	Intel 80386SX - 20MHz
✔ *COPROCESSOR*	80387SX
✔ *CLOCK SPEEDS*	20 & 10 MHz switchable
✔ *RAM CONFIGURATION*	DIP:44256 x 8 + 41256 x 4 SIMM: 4 pcs.
✔ *RAM ON BOARD*	512K / 1 / 1.5 / 2 / 3 / 4 / 5MB
✔ *ROM SYSTEM*	27256 X 2; Shadow RAM supported.
✔ *EXPANSION SLOTS*	8 (16-bit x 6; 8 bit x 2)
✔ *DRIVE BAYS*	5 (5.25" x 3 + 3.5" x 2) All open.
✔ *FCC Certification*	Class B
✔ *PERFORMANCE:*	Landmark 26.7 / Norton SI 22.0 / MIPS 3.325

In the first ***PC Magazine Service & Reliability Survey,*** **DTK users** rated us high in all four areas (*Reliability, Buy Again, Tech Support, Repair Service*). You can put DTK's reliability to *work* for *you!*

PC MAGAZINE

WORK HORSE!

DTK 386/25 MHz non-Cache

Model KEEN-2530 Bare Bone System

✔ *MAINBOARD*	DTK PEM-2530
✔ *MICROPROCESSOR*	Intel 80386DX - 25 MHz
✔ *COPROCESSOR*	Intel 80387/Weitek 3167
✔ *CLOCK SPEEDS*	25 & 8 MHz
✔ *RAM CONFIGURATION*	SIP - 4 pcs.
✔ *RAM ON BOARD*	1 / 2 / 4 / 8MB
✔ *TOTAL SYSTEM RAM*	Up to 16MB
✔ *ROM ARCHITECTURE*	Shadow RAM supported
✔ *EXPANSION SLOTS*	8 (32-bit x 1; 16-bit x 5; 8-bit x 2)
✔ *DRIVE BAYS*	5 (3 x 5.25" + 2 x 3.5")
✔ *PERFORMANCE:*	Landmark 31.7 / Norton SI 27.1 / MIPS 4.35
✔ *FCC CERTIFICATION*	Class B

Check 'em Out!

Give your computer a firm foundation...a DTK Bare Bone® System. See your DTK dealer or call us for the name of a dealer near you.

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DTK Bare Bone® Systems include case, motherboard, and power supply. Monitors, drives, and keyboards are not included. "dtk" logo and BareBone® are registered trademarks of DTK Computer Inc. Other names and logos are the trademarks of their respective owners.

DTK users rated the company more favorably than users of ALR, AT&T, Epson, Everex, and IBM rated their manufacturers.

USERS RATE DTK HIGH IN *PC MAGAZINE* POLL

Users of DTK Computers rate its products higher in terms of service and reliability than many well-known brands.

Nearly 18,000 *PC Magazine* readers completed questionnaire evaluations in four categories with responses geared to the computer the respondent uses regularly.

Users of DTK units rated their computers as average or above in all four categories surveyed, the only company earning the distinction.

In Reliability, DTK was ranked higher than ALR and Packard-Bell. In the Technical Support area, DTK outperformed ALR, Acer, AST, AT&T, Compaq, and IBM.

The results were similar for Repair Service, with DTK leading ALR, Acer, AST, Compaq, Kaypro, Tandy, and IBM.

The fourth category involved buying the same brand again. DTK users rated the company more favorably than users of ALR, AT&T, Epson, Everex, and IBM rated their manufacturers.

More than 400 brands were mentioned by readers with at least 75 mentions necessary for inclusion. Only 27 of the brands qualified for inclusion in the survey results.

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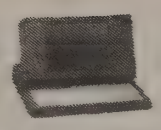
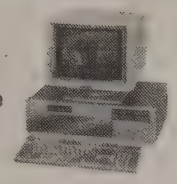
- VGA 640x480 (16 gray shades)
- External VGA Port
- 1 Serial/1 Parallel Port
- Size: 2"x12"x10"
- Weighs less than 7 lbs including battery
- Supports: DOS, Windows 3.0, OS/2, Xenix



$2245

486-25 MHz System

- 64K Cache
- 1 MB Expandable to 16 MB
- Landmark=115
- BIO Shadow RAM
- Supports External Weitek
- Teac 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave FD/HD Controller
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



$1420

33 MHz $1600

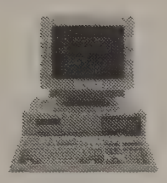
386-33 MHz 64K Cache System

- 1 MB Expandable to 32 MB on Board
- C & T Chip Set
- 64K Cache Memory
- TEAC 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave FD/HD Controller
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply

$810

386-25 MHz System

- 1 MB RAM on board
- C & T NEAT Chip Set
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy Drive
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



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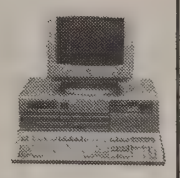
386-SX 16 MHz System

- Intel 386-SX CPU
- 1 MB RAM on board, Landmark=21.6
- C & T NEAT Chip Set
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB Floppy
- Serial, Parallel, Game Port
- 101 Keyboard
- Choice: Regular Baby Case or Small Vertical Case



$515

20 MHz $555

286-12 MHz System

- 512K RAM Exp. to 4MB
- 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- 101 Keyboard
- Choice: Regular Case, Baby Case or Small Vertical Case

$310

20 MHz. $360

12 MHz XT System - CALL

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ST-251-1 (40M)	$238
Western Digital 40 MB	190
Western Digital 85 MB	320
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Maxtor 4170E 150 MB	850
Fujitsu 135 MB	500
Toshiba 100 Meg IDE	400

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Everex 1200 Baud (int)	$54
Everex 2400 Baud (int)	85
Everex 2400 Baud MNP5 (ext)	195
Everex 2400 Baud MNP5 (int)	150
Everex 2400B (ext)	165
Everex Fax Modem	255
Pocket Modem	CALL
9600 Baud Modem	CALL
Ext 2400 Baud Modem	98
Int. 2400 Baud Modem	65

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Big Vertical Case w/PS	$165
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Deluxe XT Case	35

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Panasonic KX-1180	$153
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Panasonic KX-1524	375
Panasonic KX-1624	375
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Trident w/1Meg	110
FD/HD 1:1 Controller (MFM)	65
AT I/O (2S;1P;1G)	25
XT Multi I/O	39
Floppy Controller (360, 720, 1.2, 1.44K)	35
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XT-H/D Controller WD-Gen	50
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DTC 7287 RLL FD/HD (1:1)	85
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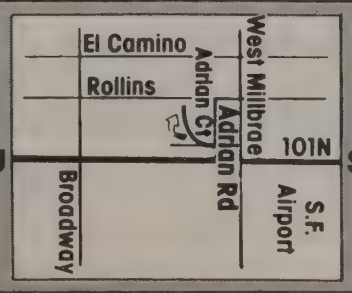

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Zen And The Art Of Troubleshooting

Figuring Out What's Wrong With Your PC And How To Deal With It

BY BROCK N. MEEKS

Let's start with a confession: I'm not now, nor have I ever been, a "techie." I've managed, these long years, to wade through a variety of arcane telecommunications technology, but that's merely trial and error. Start asking me about bits and bytes and memory addresses, and my palms start to sweat.

But I can strip my PC to the bare metal chassis and fix 90% of the problems that occur. And if I can do it, I know you can. Here are some tried and true steps to troubleshooting. Follow them. They work.

DON'T PANIC

So your faithful electronic beast of burden decides one morning to just pack it in and not boot. Don't panic. Pretty simple advice really. Standard fare for most crisis situations, and it's no different when your PC takes the slow train to Cleveland.

Pull this article from your clip file. Pour yourself some coffee and promise yourself, once again, that you will never put off a deadline until the last minute. (It's a cosmic law that problems only occur on deadline—a simple random poll on BART will prove this.) Settled down? Good. Now you can move to the next step:

I WILL WIN

Sounds incredibly Zen, doesn't it? But it's true. If you go into this crisis thinking you're hopelessly lost and that your checkbook's going to be in shambles after repair bills, it's likely to be a self-fulfilling prophecy.

Remember, this isn't brain surgery. You're working on a machine made of plastic, silicon, and metal. When your PC is working it follows a logical progression of steps to reach the desired output. Now that it's "sick," you'll simply be the one following the logic.

OK, mental attitude pumped? Great, let's move on.

WRITE EVERYTHING DOWN

Grab a pen and some of that scrap computer paper and start taking notes. This will give you a chronology of your efforts. If you're called away, you can pick right back up without duplicating any effort. Taking notes is vital in order to record various symptoms. What sounds is your PC making? This machine speaks its own language, a series of short and long beeps, so what's it saying? (We'll cover "PC speak" a bit later.)

And by writing things down you'll have a ready made "cheat sheet" when the same thing happens (on deadline, no doubt) to one of your friends' PCs.

DO THE EASY STUFF FIRST

OK, helpful hint time: be lazy. Yeah, exert as little force as possible. You want to be productive, not become an expert PC technician, and by doing the easy stuff first you can eliminate, and, in the majority of cases, fix the problem without spreading the innards of your PC across the living room floor.

The first and easiest step: make sure everything's plugged in. Sounds crazy, right? "Of course everything's plugged in, Brock, do I look stupid?" No. But cords get knocked out by Rover chasing Spike around the office. And sometimes, I swear, cords just drop out of a wall socket through entropy. Regardless, check the cords and make sure everything's plugged in and turned on.

Helpful hint two: the following three steps will make you a magician. Clean edge connectors; dust off all components; reseat all socketed chips. I guarantee these three steps will cure 90% of all intermittent problems.

Edge connectors get dirty and make circuit boards fail. There are several commercial edge connector cleaners—even environmentally safe ones that don't contain freon. And if you're the eraser type, *don't* use a pink eraser! These are too abrasive, and will actually put microscopic pits into the thin gold plating on edge connectors. The dirt will build up faster and faster and you'll find yourself "cleaning" edge connectors every other day (it's as if the edge connectors are becoming "addicted" to being erased). Use a white artist's eraser, if you must erase.

Next, blow all that dust out of there. That dust acts like a cozy blanket for the chips and it keeps the heat *in*, not out. And chips are wimps: they don't like heat. And because those chips heat up and cool down on a regular cycle they fall victim to the infamous "chip creep" syndrome: the constant heat/expansion/cool cycle causes the little "feet" on the chips to work their way out of the sockets.

Don't just jump in and assume the worst. Try to isolate the problem at the simplest level (often a cable connection) and go from there.

So get those boards out and begin *gently* pressing those chips back in with your thumb. You'll hear the chips pop and creak (it's actually a nice little piece of tactile feedback). If you've never done this try it, today—you'll be amazed at how much "travel" these chips have done. Reseating the chips, of course, means they make better connections. I can't tell you how many intermittent errors I've solved just performing these three steps.

Not too glamourous, I admit, but it works.

REBOOT AND TRY AGAIN

Too easy? So what? Refer to the step above. If rebooting fixes the problem, don't knock it (like we've said, you're probably going to be on deadline anyway and as long as the puppy is working...)

Rebooting may take care of a memory clash; it may reset a parity bit here or there. You don't really care; I certainly wouldn't. If it works, it works. Control-Alt-Del, the "three-finger salute" to the rescue.

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SAMTRON HAS THE ONLY SUPER VGA MONITORS THAT ARE PixL PERFECT.

When you do something a lot, you can become very good at it.

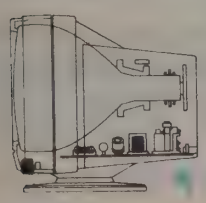
Like Samtron. They've been producing most of the world's CRTs and a large part of the world's monitors for nearly a decade. So they've learned a great deal about making monitors with exceptional qualities. In fact, they've learned how to make them PixL Perfect.™

One Board Fits All.

These monitors come with Samtron's unique, sophisticated design that packs the electronics onto a single, compact video board. Even the power supply. This streamlines internal electronics. Adding to reliability. While simplifying maintenance.

Plus, their single hybrid IC contains all the circuitry normally found on multiple power supply components. Reducing heat. And thereby extending monitor life.

Samtron's exclusive One Board™ also contains an automatic degaussing coil that gives you the sharpest image without manual adjustment.



The automatic degaussing coil, switching-mode power supply, two-stage line filter and power supply on One Board.

Perfectly Simple.

Another thing you get with PixL Perfect monitors is Samtron's universal switching-mode power supply. It automatically adapts to any voltage from 90 to 260, without changing transformers.

And their two-stage line-filter circuitry tops FCC regulations and EMI for magnetic emission. That makes their new monitors safer for people, safer for other equipment.

Perfect Is As Perfect Does.

But what is it like to work with monitors that are PixL Perfect?

Take resolution. To see exactly how good they look, just check the chart below.

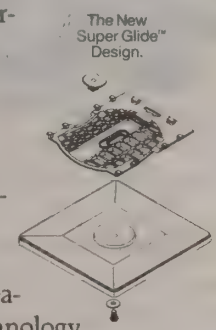
MODEL:	SC-428V	SC-428VS	SC-428VX
CRT/Dot Pitch:	14"/0.28	14"/0.28	14"/0.28
H. Frequency:	31.5 KHZ 35.2 KHZ 35.5 KHZ	31.5 KHZ 35.2 KHZ 35.5 KHZ	31.5 KHZ 35.5 KHZ 48 KHZ
V. Frequency:	43.5 HZ 60/70 HZ	43.5 HZ 60/70 HZ	72 Hz 60/70 HZ
Resolution In Pixels:	1,024 × 768	1,024 × 768	1,024 × 768
Compatibility:	IBM 8514/A APPLE MAC II	IBM 8514/A	IBM XGA (FLICKER FREE)

The more pixels (dots) on the screen, the higher the resolution and the sharper the display.

What's more, their dark-tinted, non-glare face gives you clear, crisp colors while cutting reflections.

You also get your choice of CRT coatings with Samtron. For greater scratch resistance, choose their hard, chemically etched finish. Or for the sharpest possible display, their silicon coating.

Along with easy-to-use, up-front controls, they've made one-hand, tilt-and-swivel adjustments a reality. Their SuperGlide™ system moves easily... stops solidly. And it won't overmove, so it can't damage wiring or internal parts.



New Flicker-Free Technology.

Samtron is also introducing the monitor you've been waiting for. An all-new 14-inch model featuring non-interlace technology and incredible flicker-free performance.

It gives you the sharpest images ever—even with multiple graphics on the screen. Perfect for people who use Windows.™

Monitors with all the advantages of their new Super VGA series, of course, don't come along every day. They come only as a result of Samtron's unmatched manufacturing experience.

In other words, practice makes PixL Perfect.

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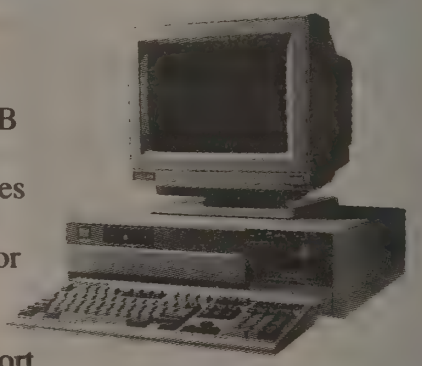

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REMOVE TSRS

These memory resident programs, known as "TSR" for terminate and stay ready, are the most belligerent of software. Often they are useful shareware programs that simply collide (in memory) with whatever application you're running. When that clash occurs, the computer acts strange or fails to act at all.

You see, here's another secret: there are no memory police in the computer industry; there's no government agency that regulates who can put what where as far as program code goes. And not a lot of people talk to each other when they're programming a TSR, even though most programmers do their best to make sure they don't collide.

Remember, this isn't brain surgery. You're working on a machine made of plastic, silicon, and metal. When your PC is working it follows a logical progression of steps to reach the desired output. Now that it's "sick," you'll simply be the one following the logic.

So, if you have a lot of TSRs running, remove them all and run your computer. All well and good? Great. Now start adding the TSRs one by one; you'll quickly find the offender. But that's only half the solution—now you're in a dilemma. If you really love that TSR, you have to live with the inconvenience of the work stoppage every now and then, or live without the TSR. I know, not great options, but it's a free world, not a perfect one.

DRAW PICTURES

Troubleshooters owe a great debt to the board game Pictionary: it's taught millions of people that even the most insipid scrawls can be interpreted as something coherent. Point is: draw pictures of what you're doing.

Drawing pictures helps you reassemble the PC; it helps you keep track of the positions of those little switches you push back and forth on the circuit boards. So draw—a lot. Because what seems easy to remember now won't be in an hour.

DIVIDE AND CONQUER

Separate the problem into components and test the components. Your internal modem doesn't work? Pull the modem card and install another. Does that one work? Great, you've just discovered a bum modem. Your A: drive won't work? Switch the connector cable and see if your B: drive (now posing as "A") works. It doesn't? Ummm...could be a bad cable or a bad floppy drive controller. Replace the cable (easy stuff first, remember?). It works? Super. You're done!

Start to get the idea? Don't just jump in and assume the worst. Try to isolate the problem at the simplest level and go from there.

NEVER GUESS

What? This can't be—the very nature of trouble shooting is "guessing." What I really mean is don't guess *stupid*. If your monitor is giving you weird colors and horizontal lines *a la* the old *Outer Limits* TV show, don't "guess" that you need a new monitor! Take out the video card, reseat the chips, install the card, and it'll probably work (this is exactly what happened to me last month).

If the computer is fine for the first hour of usage and then begins to take on multiple personalities—you just don't know what it's going to do next—don't assume that you have a major malfunction. It's probably just too damn hot inside your computer, and the chips are revolting against the heat. Put in a larger power supply (more efficient) and larger fan (comes with the larger power supply). Or put your PC in a better position to circulate the air.

TRUST NO ONE

That nice instruction manual that came with your new circuit board? It could be wrong (horrors!).

Yep, it's happened. Right there in cold type, an error in the "official" setup instructions. So even if the instruction manual says, "This has to be the way," if you've followed all the instructions to the letter, start making phone calls to the manufacturer. Quite often the customer support people will say "Oh, yeah, we know that. Typo. Here's what you're *really* supposed to do."

OBSERVE LIKE SHERLOCK HOLMES

Pop Quiz: Which light comes on first when you first boot the computer? A) the hard drive B) the A floppy C) the B floppy. Answer: the A floppy.

Missed that question? It's OK, this is a self-correcting test. My point here is that few of us really observe what's going on with our machines. So look and look hard. Where are all the cables being run? What DIP switches are set where? Which lights on the modem are blinking when?

All these are clues, and as the legendary Sherlock Holmes demonstrated, every observation is vital. You can tell a lot by looking. But observing isn't just looks, it's touch and smell. Smell is obvious: if you smell something burning, you'll be sure to observe closer next time! Touch can tell you a lot. Touching the chips will show you hot spots on the motherboard. So touch, learn how the computer feels at normal temperature; and if something goes wrong, start feeling around. If you feel something that's really hot that never has been before, you have a starting place.

LEARN PC SPEAK

This isn't difficult; I found it much easier than learning to say, "Is the safety on this Stinger missile really on?" in Dari, when I was traveling with the Afghan rebels...

That short "beep" your PC sounds just before it boots means "I'm OK and I'm going to check the hard drive now..." With luck that's the only phrase you'll ever need to know, but just in case, here are the other translations:

SIGNAL CONDITION

No beep, nothing happens	Power supply bad or not plugged in
Continuous beep	Power supply bad
Repeating short beep	Power supply bad
1 long beep, 1 short	System board bad
1 long beep, 2 short	Video problem or lack of display adapter/cable
1 short beep, blank screen	Failure or lack of display adapter/cable
1 short beep, no boot	Floppy drive adapter failure

WISH FOR LUCK

Yes, wish for luck. I swear, sometimes it is just dumb luck. Who can tell? Like I said, I'm no techie, and if I accidentally fix something, that's good enough for me; I rarely go digging for the "real" answer.

And that's it. Run through these steps and you'll fix almost everything. If your problem isn't solved, and you've followed all these steps, at the very least you'll end up with a great list of symptoms to swap with your tech support person.

Oh, one more vital step, one that I draw from my personal experience: Don't throw *anything*...it's never fixed a thing for me. ■

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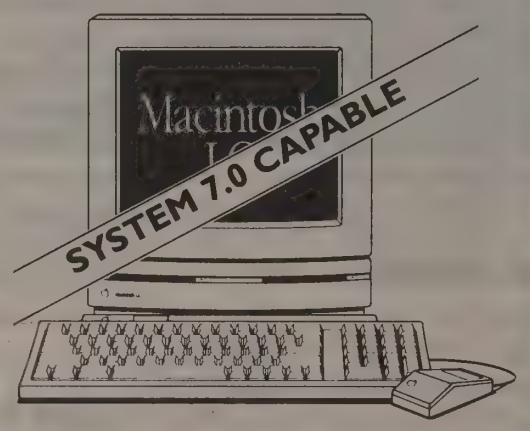

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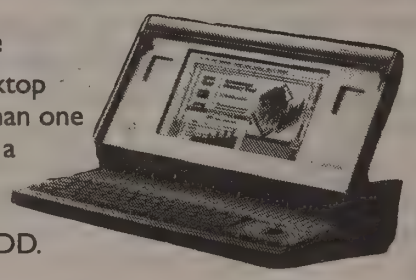

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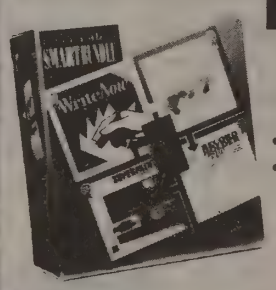

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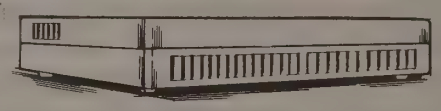

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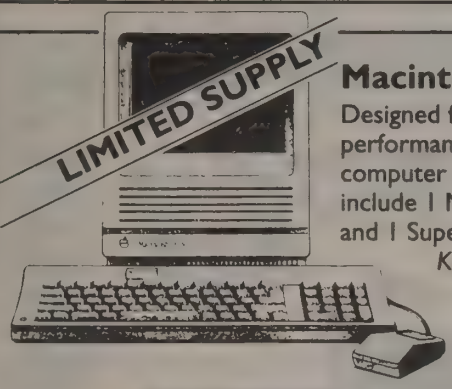

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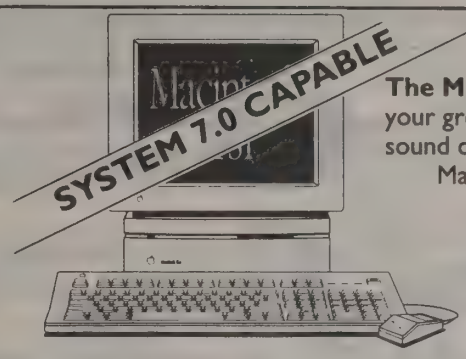

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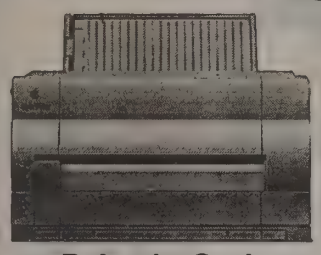

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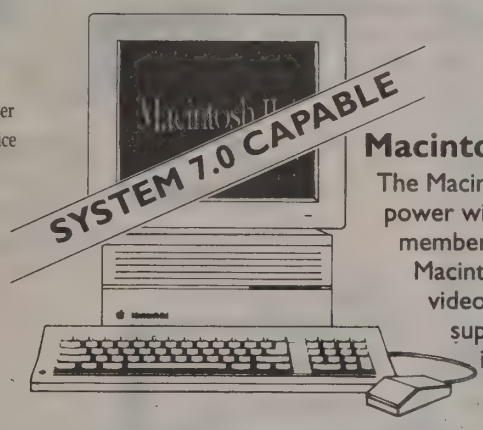

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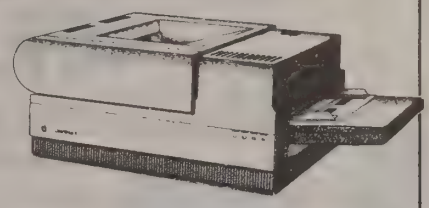

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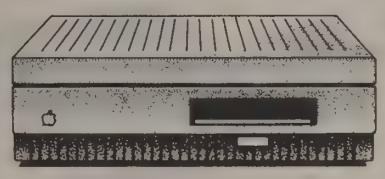

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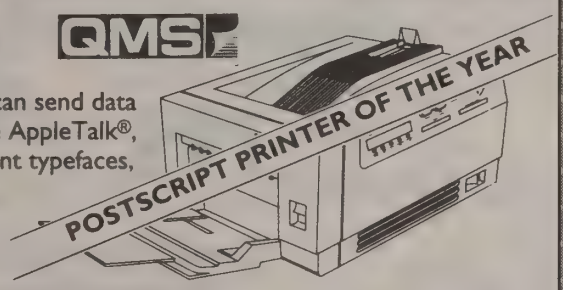

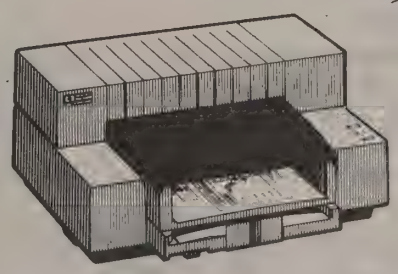

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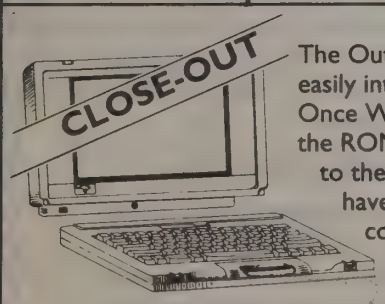

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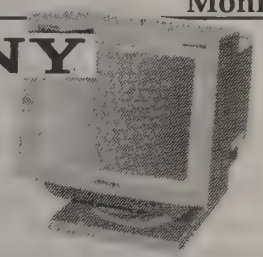

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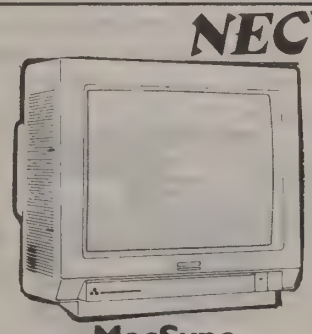

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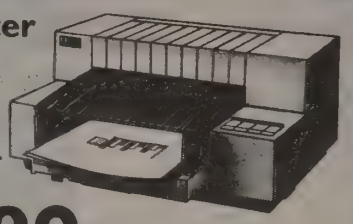

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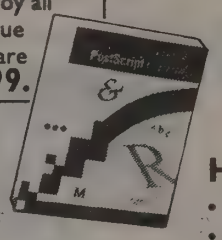

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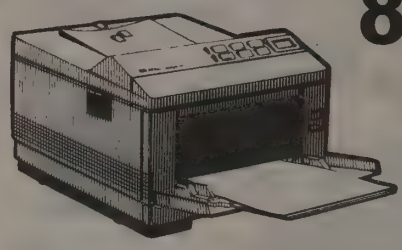

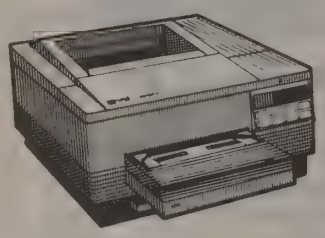

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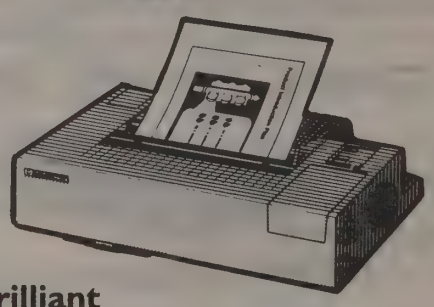

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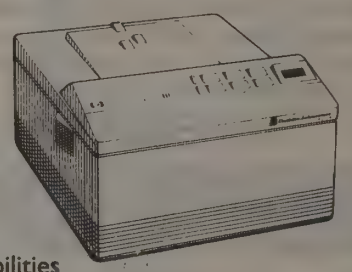

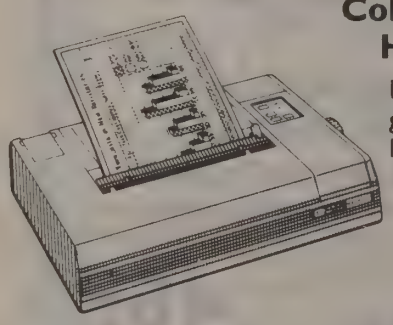

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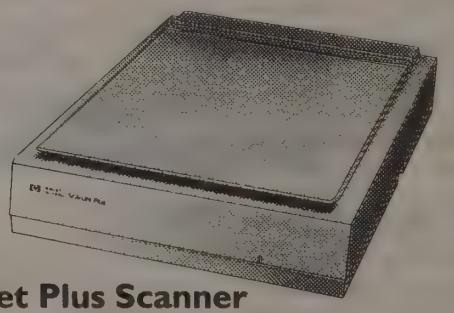

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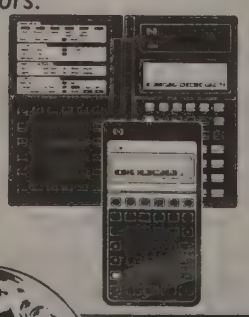

HP 17BII Financial Calculator

99.

- Complete set of financial functions
- Menus and softkeys to guide you
- Algebraic or RPN entry

Come see it today.

HP 19BII Financial Calculator..... 149.

Come see it today.

Power-users— take the lead with the new HP 48SX!

HP 48SX Scientific Expandable Calculator

- Over 2100 built-in functions
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- Graphics integrated with calculus.

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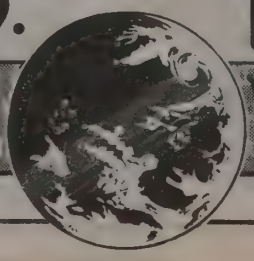

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TWO YEAR WARRANTY ON ALL EPSON PRINTERS

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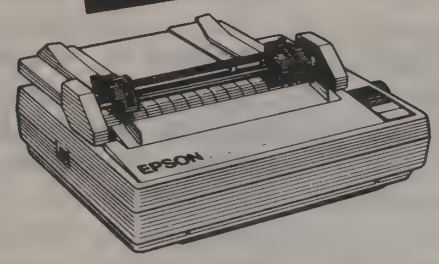
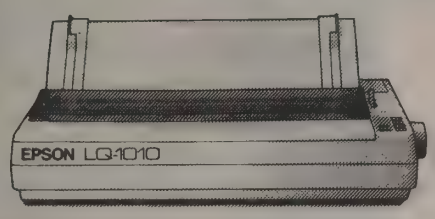
- 9 pin • SmartPark™ paper handling
- 200 CPS super draft • 30 CPS NLQ
- High resolution graphics.

169.





LQ-1010

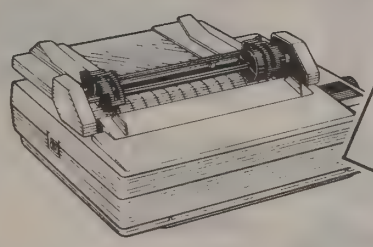
- 180 CPS draft, 60 CPS letter quality • 24 pin, 360 x 360 dpi graphics • SmartPark™ and SelectType • Wide carriage

429.

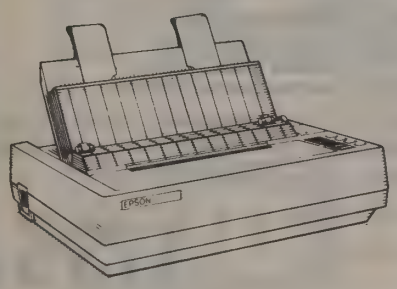
LQ-510

- Featuring SmartPark™ paper handling • 180 CPS draft • 56 CPS letter quality • 2 resident letter quality fonts

259.



FREE MULTI-MODE FONT WITH PURCHASE OF LQ-510

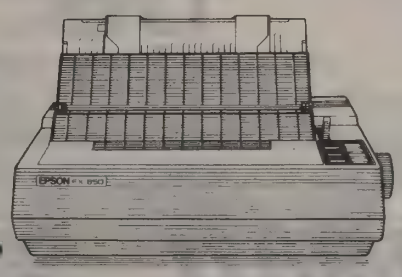


LQ-860

Epson's newest letter quality color printer

- 300 CPS draft
- 98 CPS NLQ

IN STOCK



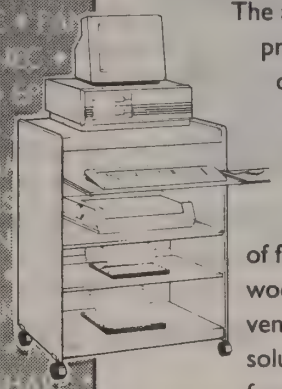
FX-850

- 9 pin dot matrix • 264 draft 54 NLQ
- Push tractor paper park for single sheet feed.

369.

Furniture

All-In-One Mobile Microcomputer Center

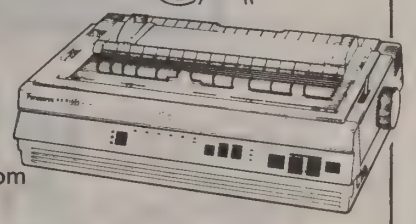


The answer to your storage problem. This space saver is designed to organize your entire microcomputer system- including your printer- in less than three square feet of floor space. Crafted from wood solids and matching veneers, this is a high quality solution for your computer furniture needs.

Panasonic

Panasonic Office Automation OA

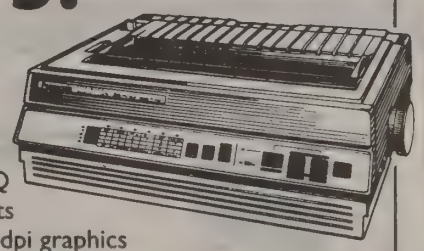
KXP-1695



- 9 pin • EZ set control panel
- 330 CPS draft • 66 CPS NLQ
- 8 resident fonts
- 16.5" wide carriage
- Push/pull tractor • Rear, bottom and front paper feed.

Limited Supply 395.

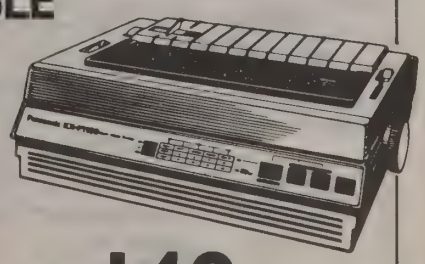
KX-P1124i



- 24 pin • EZ set control panel
- 300 CPS draft • 100 CPS NLQ
- 36 CPS SLQ • 8 resident fonts
- Push/pull tractor • 360 x 360 dpi graphics
- 2 year manufacturer's warranty

NOW AVAILABLE

KXP-1180



- 9 pin • EZ set control panel
- 192 CPS draft
- 38 NLQ • 6 resident fonts
- Push/pull tractor • 11.7" carriage.

149.

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WHOLE EARTH NOW CARRIES:

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We now carry a full selection of Maxell brand printer ribbons. Long lasting and reasonably priced, Maxell ribbons are designed to fit the most popular printers available today. **Come in and check it out!**

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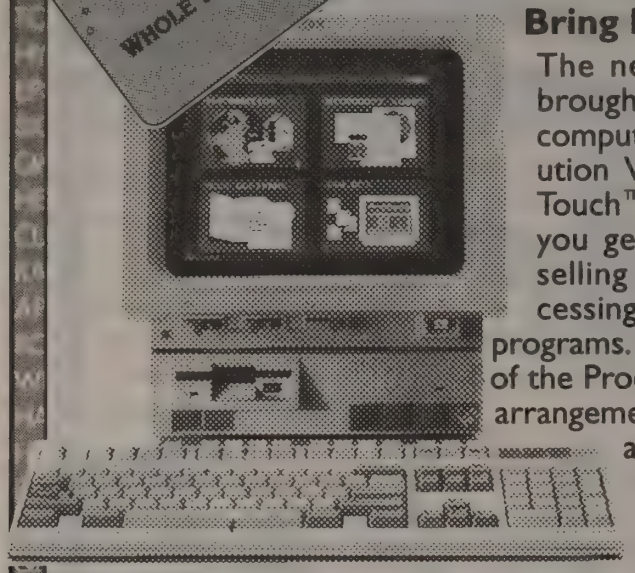
Bring It All Back Home with the IBM® PS/1™



The new IBM PS/1 is the ultimate home computer brought to you by the people who defined personal computing. Right out of the box you get a high resolution VGA Photo Graphic™ display, an IBM Selectric Touch™ keyboard, a mouse and a built-in modem. Plus you get IBM DOS and Microsoft Works®, the best selling integrated software package with word processing, spreadsheet, communications, and database programs. You also get, at no extra charge, 3 months free of the Prodigy® service for home shopping, banking, travel arrangements and more. This is an easy to use computer at an affordable price. Come see it in action today at Whole Earth Access.

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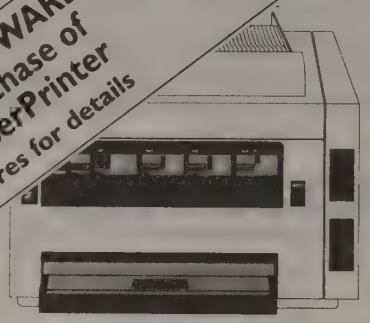

IBM Laser Printer
- 10 pages per minute
- HP compatible

1499.

Laser Printer E 999.

4019 IBM All Stores

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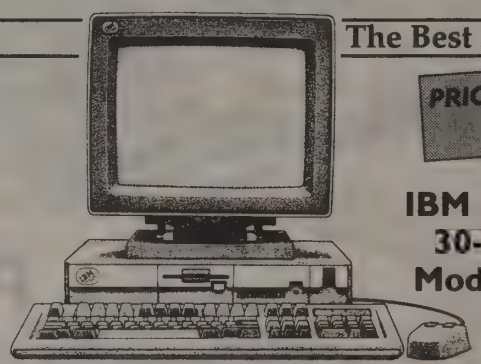

IBM PS/2® 30-286 Model 30
- 10 Mhz 80286 processor
- 1 MB RAM expandable to 16MB RAM
- 1.44MB floppy drive
- VGA graphics on board.
- 30 MB hard drive

Monitor extra

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IBM PS/2 55 Model 30
- 80386SX 16 Mhz processor
- VGA on board
- 2MB RAM expandable to 16MB
- 30MB hard drive.

Monitor extra

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PS/2 Available in Berkeley and San Jose Stores Only

IBM, PS/2 and OS/2 are registered trademarks and PS/1, Personal System/1, Photo Graphics, Selectric Touch and Micro Channel are trademarks of International Business Machines Corporation. Microsoft is a registered trademark of Microsoft Corporation. Prodigy is a registered service trademark of Prodigy Service Company.

Compaq

COMPAQ DESKPRO 386S — COMPAQ — COMPAQ LTE/286

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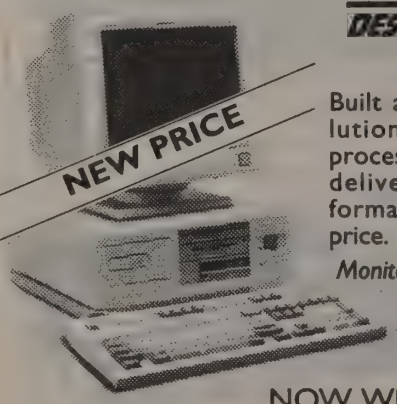

Built around the revolutionary 80386SX processor, the DP 386S delivers 386 performance at a non-386 price.

Monitor extra

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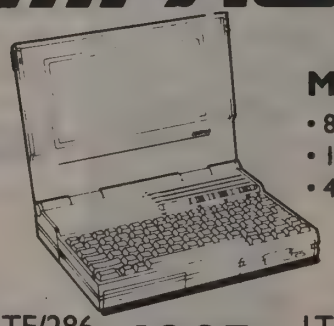
NOW WITH 2MB RAM



Model 40
- 8.5" x 11" & only 7 lbs.
- 1.44 MB floppy drive
- 40MB hard drive..

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LTE/286 Model 20 **1995.**

LTE Model 20 **1595.**

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SHARP®

NEW PRICE

Only 4.4 lbs!
- 12 Mhz 80286
- VGA paper-white LCD display
- 20MB hard drive
- 1 MB RAM
- DOS 4.01 and laplink in ROM.

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Come See This Amazing Little Computer

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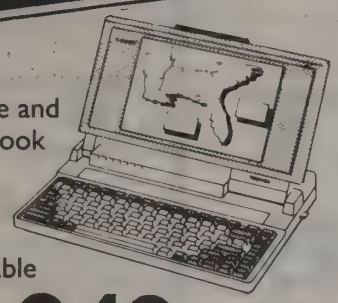
TOSHIBA

Quality Dealer

Toshiba T1000 SE



Toshiba's affordable and easy to use Notebook PC for today's business-person on the move. Plenty of comfortable features.

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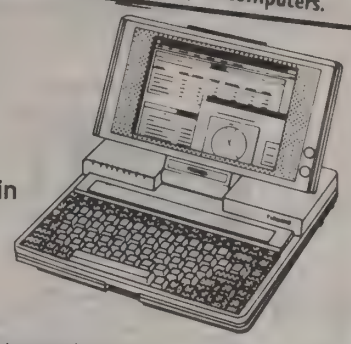
Power Packed T1200XE/40



Carry 286 hard disk power in your briefcase. The Toshiba T1200XE features a large, bright display, a comfortable keyboard as well as many other performance features to enhance your productivity.

T1200XE/20 .....1849.

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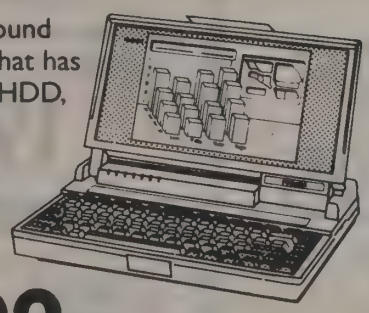
Toshiba 1000LE



Toshiba's 6.5 pound notebook PC that has it all. A 20MB HDD, a 3.5"/1.44MB floppy drive, a terrific display and keyboard.

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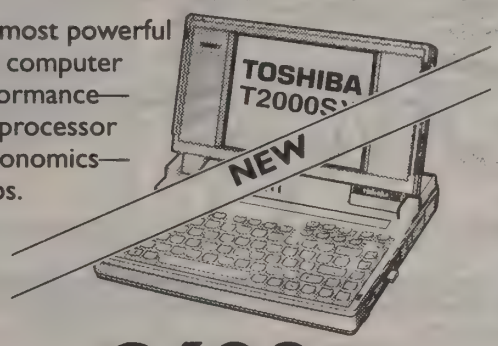
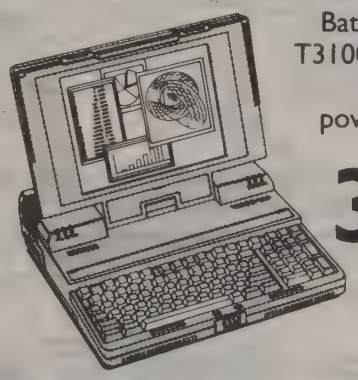
Toshiba T2000SX/20

- Toshiba's most powerful notebook computer
- High performance—386SX™ processor
- Super ergonomics—only 6.9 lbs.



Limited Supply **2699.**

Toshiba T3100SX/80



Battery-operated T3100SX. Freedom to use 386SX power anywhere.

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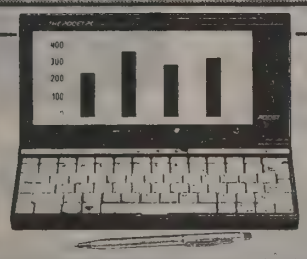
Accessories



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Everything you need, in a size you've always wished for • 2-3 months of normal use on two AA alkaline batteries • MS-DOS 3.3 runs your favorite PC software • 80-character X 25-line screen • LCD display with monochrome graphics • Built-in productivity tools.

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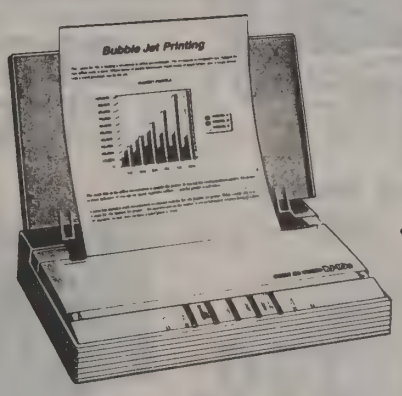
LOTUS 1-2-3 (REL 2.2) INCLUDED FREE
Offer Good April 15 - June 15, 1991

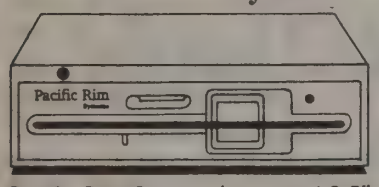


Canon BUBBLE JET PRINTER BJ-10e

- Portable 300 dpi printer
- Optional sheet feed.

349.

Pacific Rim Systems



Pacific Rim Systems' external 3.5" and 5.25" floppy drive subsystems are available for every PC

See stores for the model you need!

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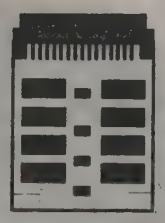

- Lifetime warranty
- Available for all Toshiba portables
- This month's special.

2MB T1200XE 179.

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Kodak Diconix 150 Plus

The laptop companion that prints in draft, NLQ and/or quality mode, designed with portability in mind.

379.

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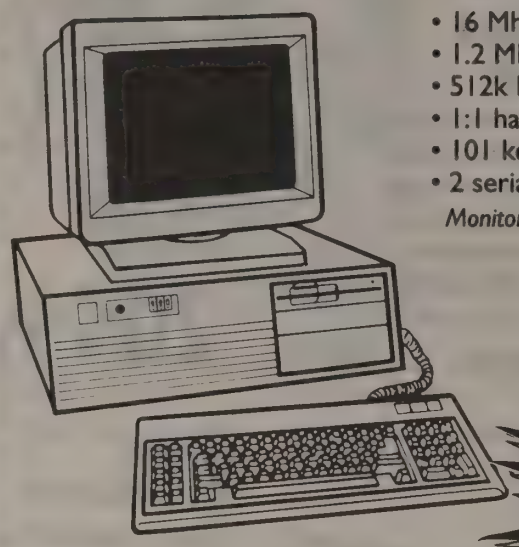

Turbo 286 16

- 16 Mhz 80286
- 1.2 MB floppy
- 512k RAM
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

Monitor, display card extra

499.

386SX

- 16Mhz 386SX
- 1 MB RAM
- 1.2 MB floppy
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

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FREE SOFTWARE "Night Shift" by Lucasfilms ™ Games FREE with Purchase of a Complete* VGA ComputerSystem. Offer good while supply lasts. *CPU and Monitor

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- 1 MB RAM
- 1.2 MB floppy drive
- 1:1 hard drive controller IDE
- 64k cache
- 101 keyboard

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Errors subject to correction.

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WEA S486-25 Standard

- 4MB RAM upgradable to 8 MB on motherboard; 16 MB w/32 bit memory card
- I/O, 1.2 MB FD, 101 keyboard
- 1:1 hard drive controller IDE
- Desktop case •AMI BIOS
- 64 K RAM cache, upgradable to 256K
- 1-32/8 bit slot
- 6-16 bit slot • 1-8 bit slot
- Weitek math co-processor socket.

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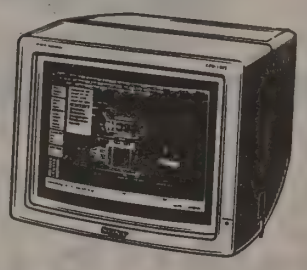
SONY

Sony 1320 VGA

- VGA color monitor
- Analog input
- .25mm aperture grid

499.



HYUNDAI

HCM-402C

- 14" VGA color
- .31 dot pitch
- Includes tilt & swivel base

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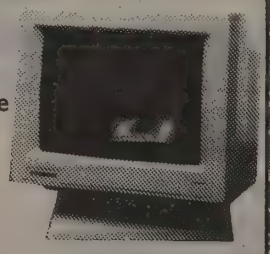
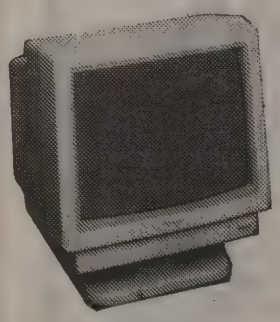
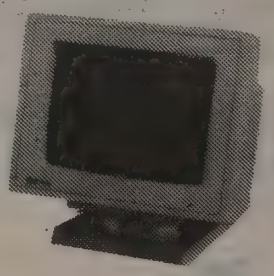




Leading Technology 1458U

14" analog multi-frequency 640 x 480, .51 mm dot pitch

299.



Leading Technology 1480A

- 14" amber flat screen 720h x 350v with tilt and swivel.

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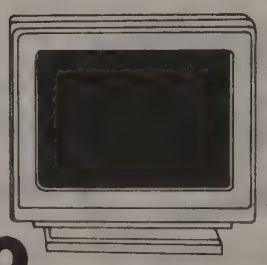
NEC

MultiSync 3DS

The NEC 3D is one of the best multiscan monitors made. 1024 x 768 resolution means you can use sophisticated Super VGA software and hardware with this screen.

629.

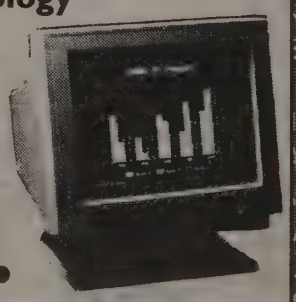


Leading Technology

12" Amber Monochrome

- Non- glare • 720h x 350v with tilt & swivel and cable

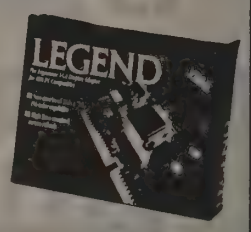
99.



SIGMA DESIGNS

Sigma VGA Legend

- 1024 x 768 • 16 colors
- Interlaced or non-interlaced
- No switches or jumpers
- 512 K video memory upgradable to 1 MB • Exceeds European ergonomic standards for flicker-free displays
- Upgrade kits in stock (VGA CARD ONLY)



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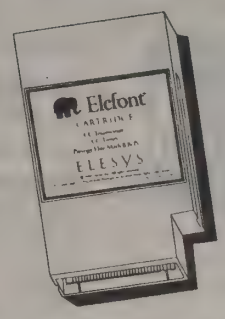

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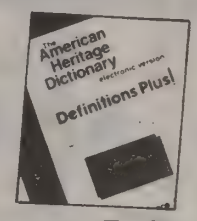

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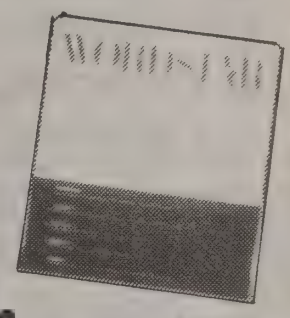

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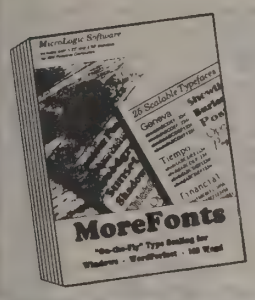

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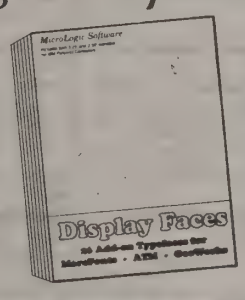

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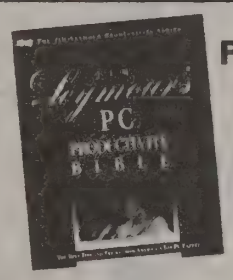

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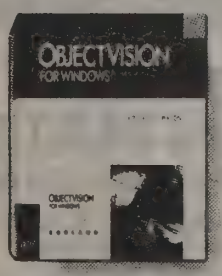

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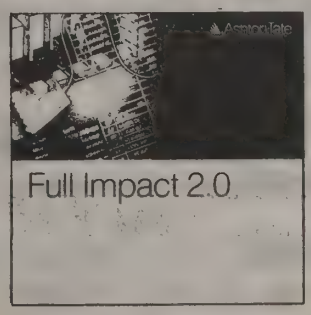

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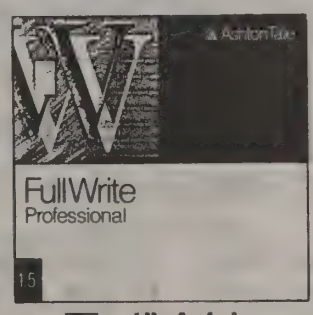

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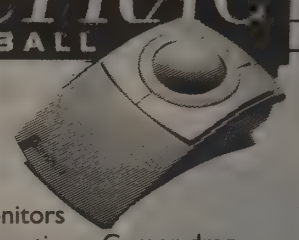

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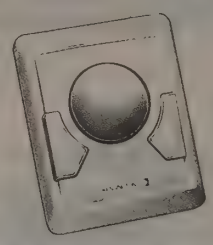

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Breaking Into Windows

Object-Oriented Languages For The Beginning Windows Programmer

BY BIRRELL WALSH

If you're a DOS programmer, you know you'll have to make the transition to Windows, and even an experienced programmer needs help with the environment change. I recently examined Windows packages from just that perspective: I am comfortable with DOS programming, and had never programmed for a graphical user interface.

Windows is complex for a number of reasons. It runs with DOS, so it is an operating system on top of an operating system. It is graphic and proposes a standard set of graphic commands for many applications. Under Windows, programs must share the space in memory and on the screen, and the CPU time, with other programs. Windows is called event-driven: anything that is going on may have to store itself, half-done, and give way to a newly arrived process that has higher priority. It must also continually scan for interrupts from other programs.

Windows is graphic, complex, and event-driven. As a programmer you know that many features mean a lot of grief. The goal is to find a programming system that gives you access to all Windows features, automates as many of them as possible, and integrates power and usability. The criteria I use to evaluate the languages are just these: power, automation/accessibility, and integration.

"Power" means the ability to do anything with Windows, DOS, and the hardware.

"Automation/accessibility" means that there is an easy, default version for basic objects and operations (like opening a text editing window). It also assumes a good tutorial.

"Integration" means that all the features are available at the same time, without switching between programs.

There's no doubt that object-oriented programming systems are worth all the hype we've heard about them. Objects allow you to design code and reuse it in application after application. Committees can subdivide a programming project and keep their parts of the code watertight by carefully segregating classes of objects. The discipline of object design makes clear programming a lot easier.

I examined three object-oriented Windows programming packages which I had reviewed earlier in their DOS versions. I roughed out the same simple five-class application in each language, and compared the effort and success.

In scoring these programs for the newcomer, I give equal weight to power, integration, and automation/accessibility. An experienced Windows programmer may consider automation much less important, while emphasizing power and integration.

BORLAND C++

A long-time Borland fan, I assumed that the Scotts Valley developer would make the perfect introductory package to Windows —powerful, complete, and accessible. I was right on two out of three counts.

Borland C++ is the standard object-oriented extension of C in the DOS world. Before Microsoft has released a single C++, Borland has issued several versions. "Turbo" C++ is for the DOS world and continues to be supported, while the newer "Borland" C++ can be used to program in both DOS and Windows environments.

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Unlike some compilers, Borland's C++ translates directly from C++ source code to native machine code. There is no intermediate step in which C code is generated. The programs created by Borland's compiler are fast and clean. If they aren't, you can use one of the three debuggers Borland has included with the package: one is resident in the programming environment, and two others can be loaded as separate packages, one Windows-specific. Included is a profiler that will allow you to find which sections of your program are wasting time. An assembler completes the package.

Because C++ is a superset of C, any code you've written in C can be included in a C++ application. For companies and projects with massive C libraries, this alone will determine that they migrate to C++ rather than to another Windows language.

C++ is the language of dedicated programmers across North America, and Borland has issued the best version of C++. Major trade publications have been giving it the highest review scores, and it certainly is a lush environment for the DOS programmer. But I have questions about the program as a Windows tool for a beginner.

Borland C++ will write Windows prolog and epilog code for you. It does include the Whitewater Resource Kit, a Windows application with which you can edit Windows Resources much more easily than with Microsoft's Software Developers Kit for Windows, and with almost as much power. The Whitewater kit gives Borland C++ much

Because C++ is a superset of C, any code you've written in C can be included in a C++ application. For companies and projects with massive C libraries, this alone will determine that they migrate to C++ rather than to another Windows language.

of its automation/accessibility as a Windows system.

But Borland C++ does not include a Windows tutorial. It settles for twenty-seven pages of information in one manual. When you send in your registration, you're supposed to receive a copy of *Charles Petzold's Programming for Windows*. I'm still waiting for mine.

The generation of Windows objects in Borland C++ is not automated. For a program to be accessible to a beginning Windows programmer, it should offer default Windows objects that you can use: an easy window, an easy dialog box, an easy edit window, with sample code in a sample application. These will allow you to get up and running. Later you can use more complicated commands to polish the application. The Whitewater Resource Kit provides some automation/accessibility, but it is inadequate for a beginner.

The package scores poorly on integration of its features, a surprise from the company that invented integrated programming environments for DOS. Borland C++ is *not* a Windows program itself—you have to run it as a DOS application under Windows. The Resource Kit is a Windows application which must be used separately from the program editor and compiler. You could program for Windows in Borland C++, especially if you already knew Windows programming; but if you had that knowledge in sufficient depth you could program for Windows in most any language.

This is the first time a Borland language has not made excellent provision for the novice. My impression is that Borland wanted to get to market very fast with a "Windows" package before Microsoft could release its much-announced Windows BASIC or its own C++. Borland should fill the gaps in its C++ with a Windows version of the environment, a good tutorial, and lots of sample code.

Borland C++
Power: 9
Automation/accessibility: 5
Integration: 3
Total: 17 of 30

KNOWLEDGEPRO (WINDOWS)

KnowledgePro (Windows) is a complete Windows development language that makes some shrewd simplifications of the Windows environment.

Its publishers guess that most users are going to be working with text, even though they're migrating to a "graphic" environment. They guess that most people really need to manipulate text more than they need to manipulate data structures. They sacrifice some power for considerable simplification.

KnowledgePro comes from the expert-system tradition. In building for the Windows environment, the publishers adapted their successful DOS expert system by giving it commands to manipulate the Windows world. It remains fundamentally a text-based, expert-system language. Screen coordinates are in text rows and columns rather than in pixels. Graphics are managed as if they were inlays into a basically textual application. Windows is simplified for the majority of us who will be doing text inside the Windows environment.

KPWIN includes enough introduction to get you going in both Windows and the KnowledgePro language itself. The language was originally designed to handle rule-based decision making, so it is particularly well-adapted to expert systems that help users to reach conclusions. The publisher has included hypertext functions as well, so you could easily program a complete help system in KP without having to design hypertext or decision trees from the ground up.

What may both puzzle and delight the user is KP's data type. Yes, it really has only one: the "topic". Topics in KP can have a value. If you say

Joe is 3.

and then ask for the value of Joe with the command

?Joe.

you will get "3" back. Topics also can be functions, which execute when you send them the "?" message. They can have other topics within them, a feature which allows data-hiding and is the basis for KPWIN's version of objects. And they can have multiple values at the same time, because the value of a topic turns out to be the familiar linked list.

Linked lists have caused programmers both frustration and joy over the years: They are an infinitely expandable, infinitely nestable data type. But they require a certain subtle handling, and they can confuse both beginners and veterans.

As a result of its accessible Windows interface, you usually get your first KP application running in a half hour. When you try to build a full-scale project, though, I guarantee you some confusion about topics and lists. If you want to work with text and rules, it is worth the grief to master this language. It will let you automate just about anything that can be done in text.

There are extension kits available for mathematical functions, graphics, and videodisk controllers. KnowledgePro is an interpreter, but a runtime version is included at no charge. You can distribute your application without royalties.

KnowledgePro Windows is the tool of choice for corporate policy manuals, help systems, and expert systems in general.

KnowledgePro Windows
Power: 5
Automation/accessibility: 7
Integration: 7
Total: 19 of 30

SMALLTALK/V WINDOWS

Smalltalk is the oldest of the fully object-oriented languages. A great deal of development has been done in Smalltalk, and it is (with LISP and Prolog) one of the leading Artificial Intelligence languages.

Digitalk has been building Smalltalk/v for DOS for a number of years. When the migration to Windows began, they were ready to move their product to the new environment, as they have already moved it to the Macintosh and soon will to the OS/2-PM world.

In both C++ and KnowledgePro, objects are optional. In Smalltalk, objects are all you have. If you want to start a new activity in your program, you must build an object that performs that function and then send it a message to start. Smalltalk's pure object orientation

Continued on page 216

The Short Form:

Smalltalk/v (Digitalk, $499.95)
Power: 8
Automation/accessibility: 7
Integration: 9
Total: 24 of 30

+ Entirely object-oriented.
+ Highly interactive and graphic.
+ Works smoothly in Windows, Mac, DOS, and other environments.
+ Potentially an interplatform system.
- *Requires* object-oriented thinking.

KnowledgePro Windows (Knowledge Garden, $695)
Power: 5
Automation/accessibility: 7
Integration: 7
Total: 19 of 30

+ Excellent control of Windows objects.
+ Simplified Windows Interface.
+ Optimized for expert systems, text, and Hypertext.
- Unusual language and datatype.
- Many features must be purchased as add-ins.

Borland C++ (Borland, $495)
Power: 9
Automation/accessibility: 5
Integration: 3
Total: 17 of 30

+ Industry standard language.
+ Extremely well-crafted language, compiler, and interface.
+ Good Documentation.
- Not a Windows Application.
-Insufficient Windows "automation/accessibility."
- No Windows Tutorial.

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If price is your primary driving factor in computer purchasing, look closely at the HiQuality Systems HiQ 425i.

The HiQ 425i costs a measly $3,699 in our test configuration, which coincided with the standard configuration for this review. The test machine included 8MB of RAM, an external 64K RAM cache, a 201MB 16-millisecond IDE hard disk, both a 1.2MB and a 1.44MB floppy disk drive (these come standard), a 1,024- by 768-pixel video board with 1MB RAM, and a 14-inch color Super VGA monitor.

The Free Technology motherboard uses an Intel chip set and AMI ROM BIOS. The system's maximum 16MB RAM will fit on the motherboard using 80-nano-second 1MB SIMMs. The external 64K processor RAM cache with its 25-ns. SRAM SIPs should be ample for most applications, although the motherboard can hold up to 256K.

There are eight 16-bit ISA expansion slots on the Free Technology motherboard, all capable of holding full-length interface cards. In the test machine, I/O, video, and drive interface cards each took one slot, leaving five slots free. Room for expansion is one drive better in the HiQ 425i than in most desktop systems. The standard size tower case has space for six half-height drives, four of which are accessible.

Just to show that high cost doesn't always add up to high performance, the HiQ 425i tied for fastest on our processor tests and came in second on the memory test.

Bruce Brown PC MAGAZINE JUNE 11 1991

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Gaijin Meets KanjiTalk

Adventures With Apple's Japanese-Language Operating System

BY MARY EISENHART

Last May, due to improbable circumstances, I found myself dazed and jet-lagged at the International Business Show in Tokyo, with a nonexistent knowledge of Japanese and a severe case of culture shock.

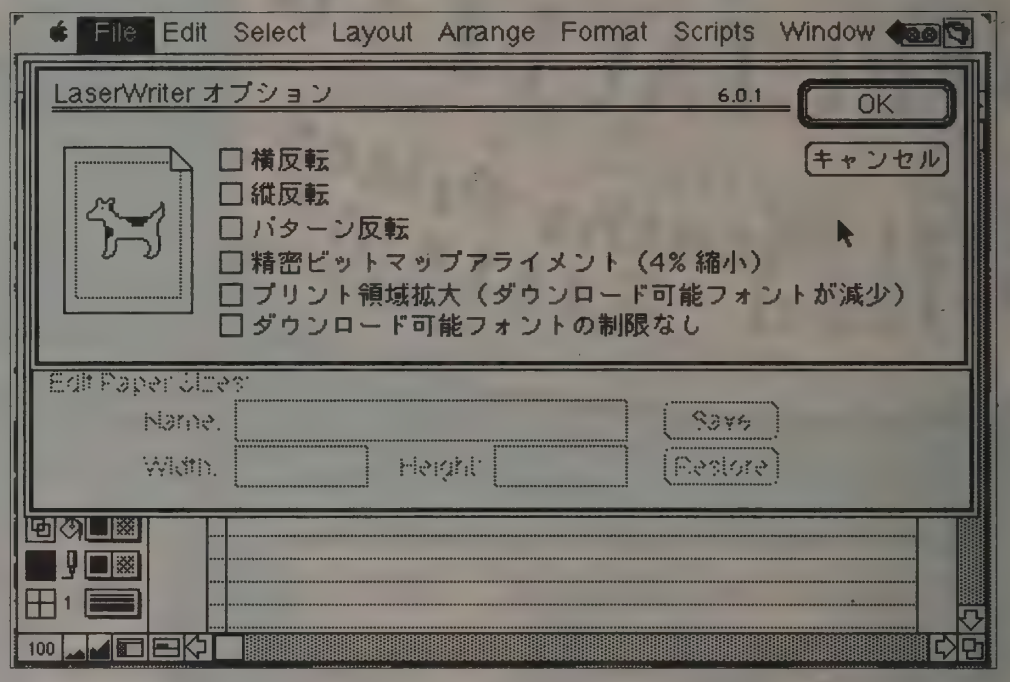
I passed the Canon booth and looked up. Japanese software was being demoed on the large screen. Not a word of English, just a little six-colored apple in the upper left.

"Oh, okay," I said, taking a closer look. "PageMaker!"

Some months later, I was staring morosely at my Japanese workbook, realizing that once the language parted company with the Roman alphabet I was in a lot of trouble. So I figured, since I do everything else with a Macintosh, maybe I'd learn Japanese faster if I was looking at it all day.

The folks in the Apple Editorial Loan program, while startled by the unusual request, made some phone calls and got me a copy of KanjiTalk, Apple's Japanese operating system for the Mac, from APDA, the developers' association.

I've had it six months now. My Japanese is not noticeably better, mostly because my English-language applications run quite happily, though there are these joyous moments when I realize that a dialog box is asking me to click "hai" or "iie." My appreciation for the consistent Macintosh user interface, however, is enormously increased, and the exploration is only beginning.



The LaserWriter options dialog in KanjiTalk (FileMaker Pro open)

KANJITALK IN THE US

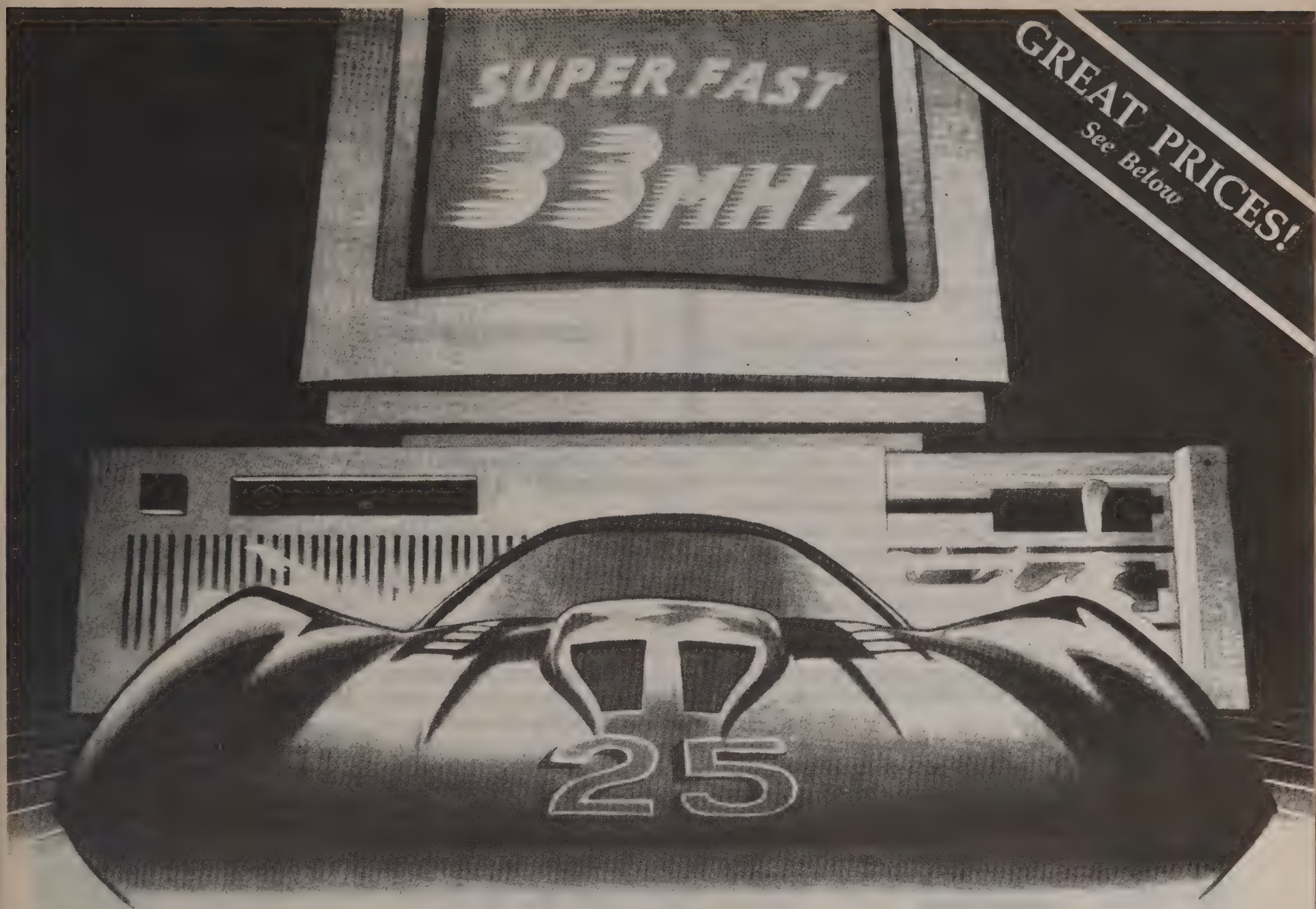
On April 23, after a year-long experiment in Hawaii, Apple announced that it would sell KanjiTalk and other products for the Japanese market in the US as well. The likely customers, it believes, are multinational corporations with headquarters in Japan (hence the need for Japanese-language documents), US companies doing business with Japan, and universities with Japanese language programs.

Participants in the Hawaii tests found that using the Macintosh and KanjiTalk offered significant advantages over their old Japanese-language system: at the Bank of Hawaii, for instance, "our usage has increased, we are seeing better performance, and we are generating better quality output," according to Toshi Matsumoto, assistant vice president of the International Marketing Division.

Requirements for becoming an authorized KanjiTalk dealer are formidable, and only fourteen sites, selected for their proximity to companies doing business in Japan or to large universities, were announced initially (two, Computer Selection of San Francisco and Computer Attic in Fremont, are in the Bay Area). Authorized dealers must provide full service and support for the Kanji products and third-party software, particularly by keeping a full-time, Japanese-literate systems engineer on staff. Properly supporting KanjiTalk requires not only an extensive knowledge of the Macintosh system but also of the Japanese language in theory and practice.

For the user buying the product for the first time—particularly if, like me, they're English speakers rushing in where angels fear to tread—support is a crucial issue. And at the same time it's added enormously to the cost of the product: whereas the KanjiTalk system, with sketchy, developer-oriented English-language documentation, was available from APDA and various retail sources for well under $100 and was often bundled with some Japanese-language software packages, KanjiTalk v6.0.7 with Japanese-language manuals, English installation and user guides, and HyperCard 2.0J carries a suggested retail of $400. If you want

However comforting that familiar Mac interface is, the moment will come when you're looking at an unfamiliar dialog box which might be asking if you want to reformat that nice hard disk. At times like this, being able to call people who understand that dialog box is very helpful.



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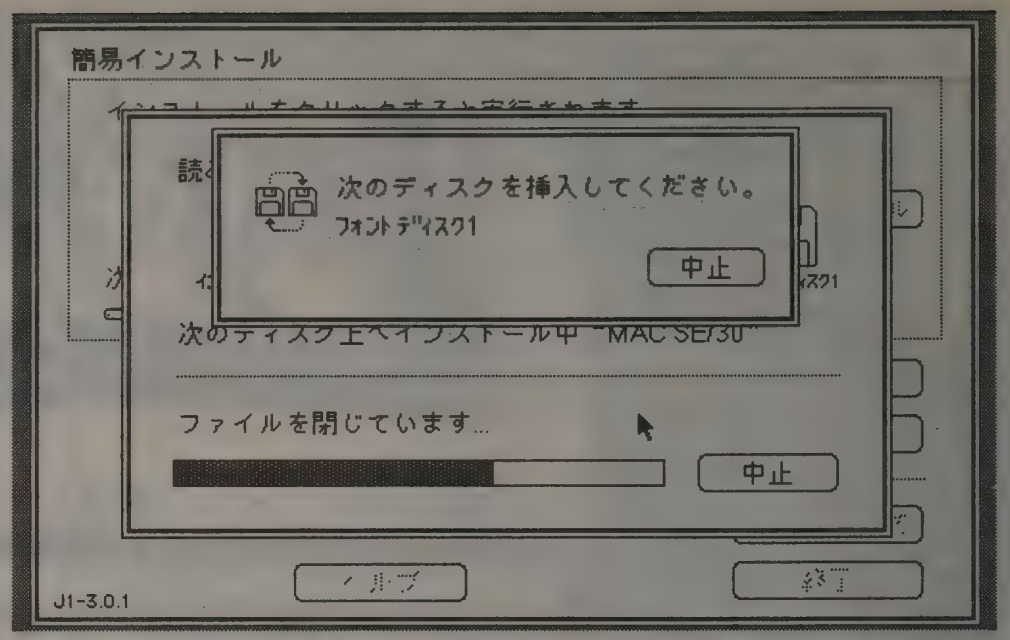
beautiful PostScript output, as contrasted to bit-mapped Japanese fonts, things get really expensive: if you've got an existing LaserWriter II, the LaserWriter II NTX-J Upgrade Kit (Apple LaserWriter II NTX-J Upgrade with controller board, 4MB of RAM, a 40MB Apple hard disk with Japanese PostScript fonts, and Japanese installation and user manuals) will cost you $4,000. If you're starting from scratch, the LaserWriter II NTX-J bundle—controller board, hard drive, engine, and toner cartridge—has a suggested retail price of $6,300.

For the corporate customer, this isn't much of a deterrent considering the advantages the Mac brings to the Japanese environment; but for students, it could be a problem. A recent article in *Mangajin*, a journal of Japanese language and pop culture, noted that the price increase had the effect of making the price of a Japanese Mac identical whether you bought it in Tokyo or San Francisco. *Mangajin* also deplored the effect of the new policy on application software prices, particularly among vendors who previously bundled KanjiTalk with their applications, and suggested that the main beneficiaries of the new pricing structure would be developers of DOS-based Japanese-language packages.

Time will tell. But if, for whatever reason, you need to generate Japanese-language documents, there's a lot to be said for doing it on a system you know and love.



If you've ever done a Mac system installation, installing KanjiTalk is both strange and familiar.

YOU CAN'T READ THE SCREEN? NEVER MIND OR, ODE TO THE MACINTOSH INTERFACE

To illustrate why all this additional documentation and support is genuine value-added, consider my first experience with KanjiTalk.

The disks arrived from APDA, saying they were v6.0.4. The documentation, however, was photocopied pages—fairly complete information for v6.0, and incremental notes alluding to the fixing of particular bugs for the subsequent updates.

The instructions said, in essence, "This is 6.0, so there isn't an Installer, just drag the icons onto your hard disk." Okay, fine, so I insert the first (English-labeled) disk, drag the (Japanese-labeled, only under the English operating system it just looks like weird characters) icons onto the hard disk, eject, and put in Disk Two.

What's this? An Installer!

Faced with a screenful of language I didn't read, a manual clearly out of touch with reality, and nobody to call, I decided that after all, this was a Macintosh system installation, right? I know how to do that... So I double-clicked the Installer icon. Fortunately the Japanese Installer works just like the English one, and I got through the whole procedure with no worse mishap than occasionally inserting the wrong disk and having it spit out (easy to do, when you're being prompted in Japanese and the disks are labeled in English).

There are definite kids-don't-try-this-at-home aspects of the situation. However comforting that familiar Mac interface is, the moment is going to come when you're looking at an unfamiliar dialog box and you're not absolutely sure it's not asking if you want to reformat that nice hard disk. At times like this, being able to call people who understand that dialog box is very helpful.

(At the same time, you'd be surprised how reluctant people in the office are to mess with your machine when the Finder menus are in Japanese.)

YOUR SOFTWARE WORKS! OR, ODE TO APPLE'S PROGRAMMING GUIDELINES

One real joy of running KanjiTalk these last few months is that (with the exception of a version of Smartcom so old Hayes has probably forgotten about it) all the Mac software I normally use works fine, in English.

True, there are occasional anomalies: for instance, the system is expecting metric measurements, and what that does to your mailing labels in FileMaker Pro is painful. (It's possible to change the metric measurements to inches in ResEdit, but ResEdit is not for the faint of heart.) Printer menus support different (international) paper sizes, and there's a certain amount of trial and error before you get to US Letter.

Depending on the application, your English-language software may or may not support Japanese-language input. Not surprisingly, Claris's English-language products are quite good in this regard, as is Microsoft Word. Your printed output will have bit-mapped jaggies but be quite clear. PageMaker, oddly enough, accepts Japanese input on the screen, but it becomes nonsense when sent to the printer. (An Aldus representative said this was predictable, since the English-language PageMaker had never been tested for KanjiTalk compatibility. Aldus does offer PageMakerJ, a Japanese-language version of 3.0).

JAPANESE-LANGUAGE INPUT

It should be clearly noted that inputting Japanese from, say, English MacWrite, lacks a certain elegance and that Apple is actively encouraging third-party developers to come up with better interfaces. (There's also a Kanji version of MacWrite.) The power user will surely want to acquire one of these packages. However, for learning and low-level word processing, you can get a lot done with just your basic English software.

KanjiTalk comes with several Japanese fonts. To type in Japanese, using an English word processor that supports those fonts, you first make sure that you've selected Japanese input by clicking the symbol in the upper-right corner (when the "rising sun" circle is displayed, the Mac is expecting Japanese; when the diamond is selected, it's expecting English) and choosing one of the Japanese fonts.

Japanese uses not one but four systems of writing, often within the same sentence. Romaji is the Roman alphabet, used in most Western languages. Hiragana and katakana (collectively known as kana) are syllabic—hiragana is used for words of Japanese origin, katakana for foreign words. Kanji is ideographic, using thousands of symbols imported centuries ago from China. Complicating life further is the fact that the same sound may have dozens of different meanings and be written with dozens of different kanji characters.

When you've got Japanese input selected, you type phonetically on the English-language keyboard. A text-entry window opens up at the bottom of your screen, and your romaji input is converted to hiragana. If you want katakana instead, hit a tab before you

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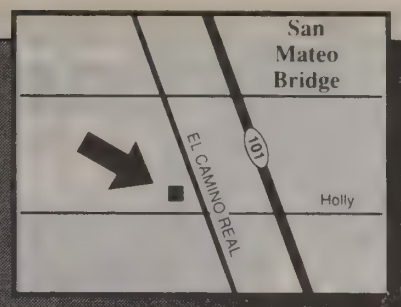

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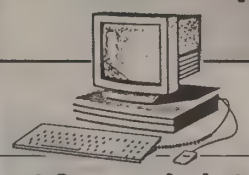

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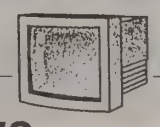

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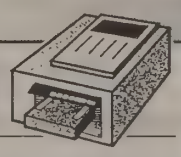

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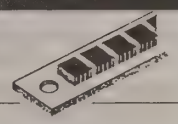

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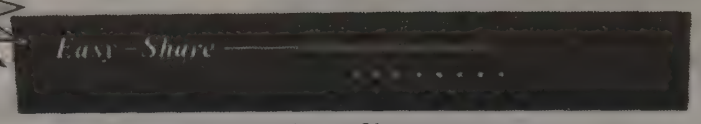

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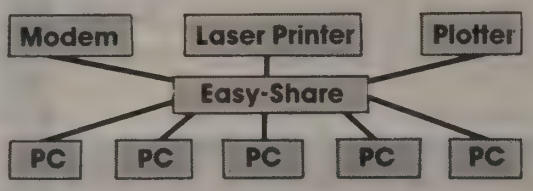

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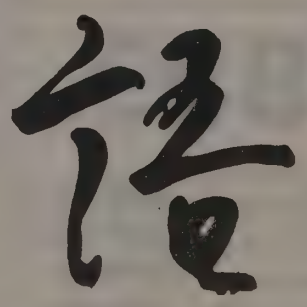

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start typing. Hit the spacebar, and your syllabic input will be converted to the system's best guess of the kanji you want. If it's not the character you want, hit the spacebar again to see and select all your choices. When you've got it the way you want, hit return, and the text you've created will be entered into your on-screen document.

RUNNING MULTIPLE SYSTEMS, OR, FUN WITH BLESSER

Occasionally you might want to switch back to your English-language system. (One of the biggest headaches in our office turned out to be that I was running KT 6.0.4 and everybody else networked to the laser printer was running System 6.0.7. Every time a machine with an alien version of LaserPrep sent a document to the machine, the printer had to reinitialize, and system bombs were not unusual. Attempts to put a single version of LaserPrep on all the machines didn't work either.)

We've all been warned about the perils of having more than one System on our hard disks, but sometimes it turns out to be useful. In order to avoid catastrophe, use a free program called Blesser.

Blesser allows you to have multiple System files and choose the one you want to run—a process known as "blessing." On your desktop, the System folder that shows a little Mac icon is "blessed."

A short version of how to use Blesser: create a folder on your hard disk called "Systems" or something similarly memorable. Drag your existing System folder, if any, into this folder, and rename it something appropriate like "System 6.0.7." Also drag Blesser into the folder. Then, from the installation diskettes, copy, *but do not install,* the System files from your second set of system software, and put them in an appropriately named folder (e.g. "KanjiTalk") within "Systems."

Open Blesser, and follow its instructions to select this second
system as the one to "bless." Restart, boot from the installation floppy of the second system, and go through the installation process. (This process ensures that the Installer doesn't simply overwrite your first System.)

Open Blesser again, select the system you want to work from, restart, and off you go.

(I haven't tried it yet, but I've been told by technically knowledgeable people that it's not advisable to use Blesser to switch between System 7 and earlier Systems, because System 7 alters your files in ways that sometimes make them inaccessible to earlier systems. It's probably best to confine Blesser adventures to roughly same-generation system software.)

STILL TO COME

In a future issue, we'll discuss some Japanese-language applications, including PageMakerJ, and the 6.0.7 version of KanjiTalk. Before that, though, we'll survey some of the current crop of Japanese Computer Aided Instruction packages, which include everything from flash cards to kanji drawing tutorials. This is, we think, only the beginning of a pretty interesting area of software development, and we'll continue to cover it. ■

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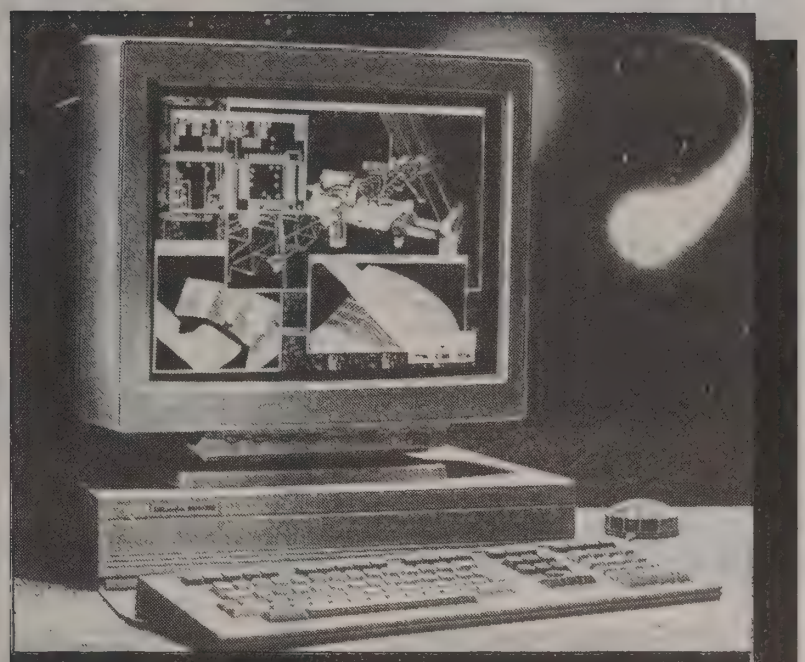

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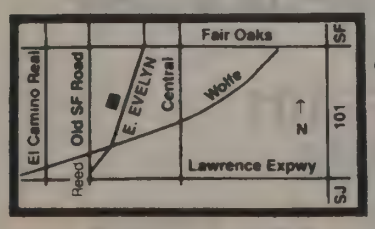

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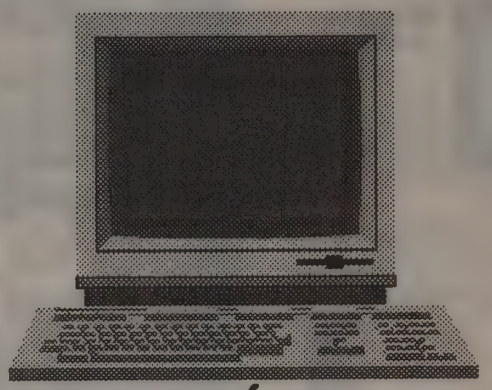

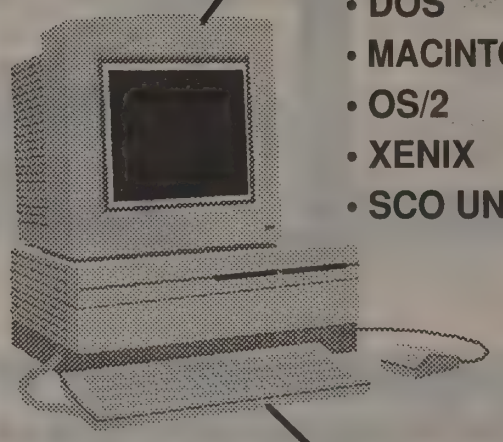

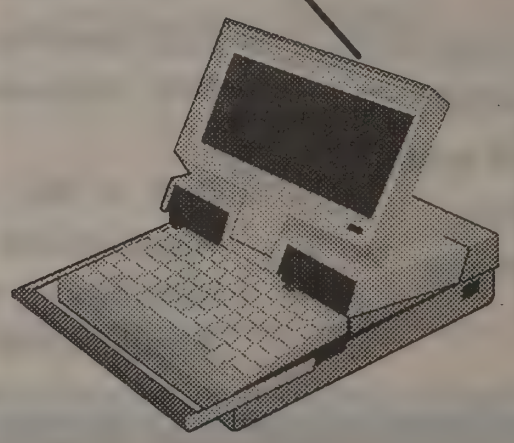

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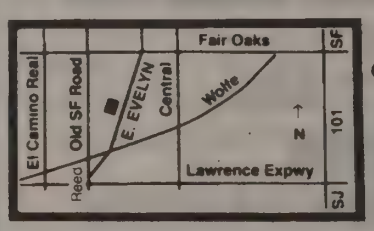

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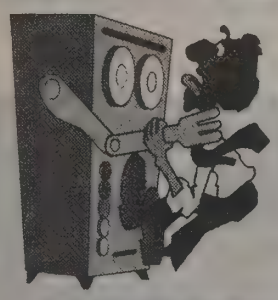

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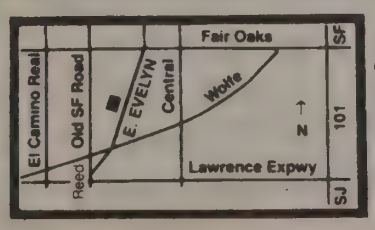

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Choosing A Multitasking Environment For Your PC:

Windows Vs. DESQview

BY LENNY BAILES AND NICK ANIS

If Microsoft Windows is truly the wave of the future, the question remains: can we coexist with it in the present?

There's no question that Windows 3 is an improvement for desktop publishers. It's definitely useful to have access to drawing, page layout, and word processing programs in an integrated, connected environment. Theoretically, Windows is also a boon for users doing other productivity tasks.

With Windows, so the story goes, novices intimidated by the DOS command line find a new sense of PC empowerment. But how about the more sophisticated users, those who have taught themselves to extract maximum productivity in the command-driven DOS environment? Does this huge, slow-moving GUI also help them get their work done? What about people who buy Windows for its DOS multitasking features? Can they install it on 16MHz 386SX machines and use it in place of WordPerfect Office or DESQview?

"Is Windows 3 the end of DESQview?" asks an ad most of us have encountered by now. More to the point, are the two products really aimed at the same customer base?

Can Windows really be all things to all people?

Windows has done well in the marketplace by addressing multiple areas which Microsoft had formerly neglected: a cosmetically attractive menuing system, a more accessible operating environment, and (finally!) adequate support for Windows-based graphical applications.

Also, Microsoft has appropriated virtual 8086 memory management techniques, which allow DOS applications to run side-by-side on 386 machines. The tricks which let Windows multitask are not new—Quarterdeck's DESQview has been using them for years. The perceived difference is that Windows "automatically" recognizes your extra memory, whereas DESQview requires additional software and fiddling to do it.

Windows 3 has some real strengths, but it also has some real limitations. "Is Windows 3 the end of DESQview?" asks an ad which most of us have encountered by now. More to the point, are the two products really aimed at the same customer base?

For some Windows users the DOS multitasking feature is icing on the cake. Their primary interest in Windows is running Windows applications. These people may task-switch to an occasional DOS application, but they don't run multiple DOS programs at the same time.

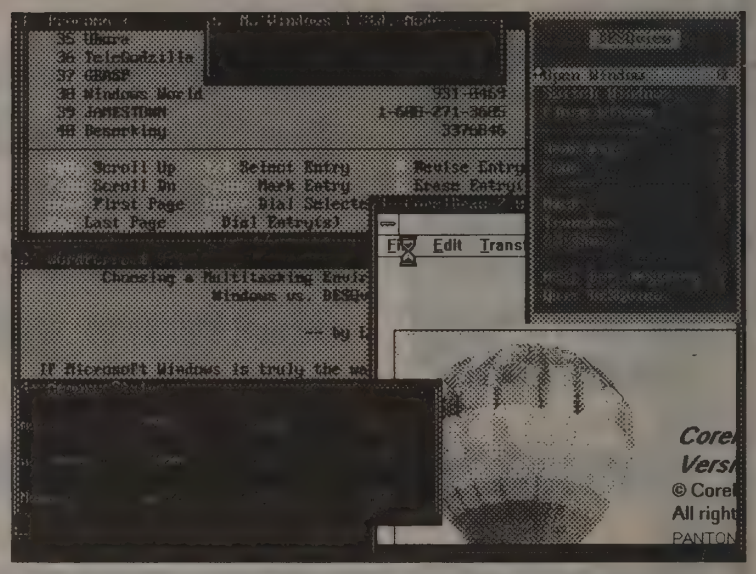
Other users require multitasking for memory-intensive background applications. They want to run bulletin board systems, spreadsheets, and database compilers at the same time. Should these people use Windows, or are they better off with DESQview?

Prospective Windows buyers also need to look at the following issues:

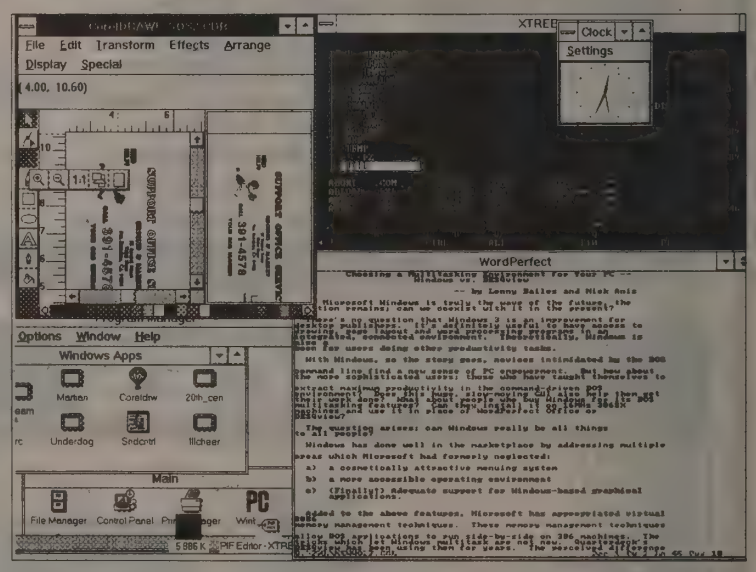
•What's the cost factor in upgrading hardware for Windows? If you need DOS multitasking, how does this compare with the hardware costs for DESQview?

•Is Windows an improvement for sophisticated DOS users, or is

Continued on page 107



DESQview allows fast DOS multitasking which can include Windows and Windows applicatons. [Windows in standard mode runs as an independent, full-screen application.]



Windows may not be the champ when it comes to performance efficiency, but its support for hi-res video allows more work space on the screen [note that Wordperfect shows 80 columns by 50 rows in one quarter of the screen].

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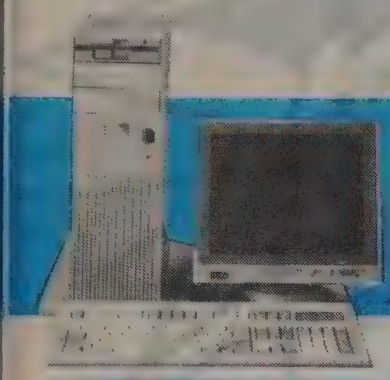

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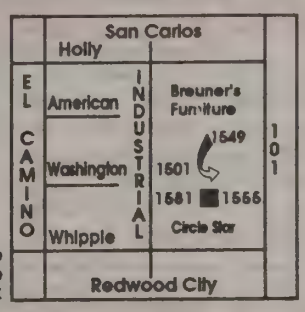

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Continued from page 102
Windows file management geared only for entry-level users?

•Does Windows increase the user-support burden? Will it steal man-hours away from productivity just to keep it running?

These questions can be answered in both economic and pragmatic terms.

HARDWARE REQUIREMENTS

Running Windows requires a substantially larger investment in hardware than running DESQview.

DESQview is a great populist with respect to hardware. With only 2MB of RAM, it will run three to four DOS applications comfortably. Performance on a 12MHz 286 is reasonably robust. Even on an 8088, you can run a background fax or communications process while toggling between a word processor and a spreadsheet.

Windows 3 does not multitask DOS applications on any platform below the 386. Experts agree that a 16MHz system needs 4MB of RAM to run more than one application satisfactorily. When two DOS applications like Procomm+ and WordPerfect run concurrently, performance in each slows down. On a 16MHz 386SX, two concurrent DOS windows behave as they would on an 8MHz AT. This is assuming you run each application full-screen. If you "virtualize" the applications into small windows, performance is cut in half again.

For Windows to duplicate DESQview's robust multitasking on a 286 machine, it needs a *25MHz 386* and twice as much memory! If your main goal is DOS multitasking, this is something you should think about.

If your primary work on the PC is done with Windows applications, a hardware upgrade to 25MHz 386 makes sense. If you use Windows applications lightly and your DOS multitasking needs are minimal, you may get by with the 16MHz 386SX.

Your system's graphic resolution is another consideration. Day-to-day use of Windows requires VGA as a minimum standard. (SuperVGA resolution of 800x600 or 1024x768 is preferred.) DESQview is comfortable with Hercules monochrome or EGA for text-based applications, but as with Windows, VGA is preferable when running graphics-based programs.

An upgrade from Hercules monochrome to VGA monochrome is relatively cheap ($250-$300). Windows users may soon get restless with VGA monochrome. To do any kind of graphics designing or publishing, they will want 800x600 noninterlaced VGA display as a minimum. The minimal cost for this is around $450. (In reality, the "Super VGA" you can buy for $450 is slightly shoddy, and it would be better to budget $600-$750).

FEATURES COMPARISONS

Assuming you're willing to meet Windows' more stringent hardware requirement, there are other factors which may influence your purchasing decision.

Ease of use: Windows offers a standard command interface to may ease the user learning curve. Only one set of fonts, video, and print drivers is necessary for a suite of productivity applications. Interapplication connectivity is available through the Windows clipboard.

DESQview offers text-based file management utilities and text-only cut and paste. DESQview is capable of multitasking high-resolution graphics programs, but each program becomes an island unto itself.

The Program Manager/File Manager setup in Windows is functional, but slow and bothersome compared to DOS shells like PC-Tools or Norton Commander. Program Manager shows a colorful facade, but the File Manager is where you have to go to do hard disk maintenance.

Using File Manager to mark files for copying takes three to four mouse clicks, accompanied by long disk read pauses. And Windows won't remember where you are for the next session. The Windows Recorder utility can set up a macro which alleviates this problem, but switching back to the Program Manager to use Windows accessories entails still more keystrokes/mouse clicks.

DESQview's DOS Services pops up a menu which offers you most of the external DOS commands as two letter options. To use DOS Services, you must already be familiar with the DOS syntax for these commands. DOS Services is a minimal shell which does not offer a lot of extra options.

With either Windows or DESQview, you may find it desirable to integrate third-party file management into your system.

User Support: The problems you will encounter in running either Windows or DESQview will vary with the complexity of the system you set up. Some users are lucky and run either program out of the box with no problems. If you want either package to get along with exotic hardware or complex software, you can count on having to fidget some with internal settings.

There are a certain number of motherboard, controller card, and I/O card combinations which behave testily with Windows. You may discover that Windows will not run in 386 mode, or that it won't recognize your mouse. Sometimes hardware limitations can be overcome, but this may require extensive scrutiny of documentation and a willingness to experiment with alternate system parameters. DESQview may also encounter hardware problems, but is generally more forgiving.

With either Windows or DESQview, you may need to do some reading, or get outside support to resolve operating problems on your individual system. The technical support lines at both Microsoft and Quarterdeck are constantly busy. Quarterdeck does have a "priority support" program which allows you fast access to a technician if you pay the extra fee.

PERFORMANCE COMPARISONS

Pro DESQview: Once you're up and running in Windows, you may discover that programs terminate unexpectedly with this cryptic message: "Undetermined Application Error." DESQview tends to have less "terra incognita." Once a program loads correctly in a DESQview window, the chances are that it will continue to operate correctly throughout your session.

Because of the way it's written, Windows 3 has trouble supporting background asynchronous communication at 9600 baud or higher. Though some sysops have reported success in running a background BBS under Windows, DESQview is considered more reliable. DESQview supports the hardware features of high speed serial cards (NS16550 buffer). DESQview will recognize additional serial ports, COM3 and COM4 automatically. Windows requires some user fudging and third-party fixes to use ports higher than COM2.

If you plan to run programs which use DOS-Extender technology, you may discover incompatibilities under Windows. Applications like AutoCAD and Paradox for the 386 have their own way of breaking the 640K barrier. They won't run under Windows 3. Microsoft chose not to support the VCPI (Virtual Control Program Interface) utilized by Rational Systems and Phar Lap. This prohibits DOS-extended programs from running under Windows. DESQview is fully compliant with VCPI. (One way to have your cake and eat it too is to run Windows 3 in standard mode from inside of DESQview. You can run AutoCAD, Lotus 1-2-3, or Paradox in one DESQview window, and toggle back to another window for PageMaker, CorelDRAW, and Word for Windows.)

Pro Windows: Windows running on a 386 tends to be slightly more reliable than DESQview with high-resolution SuperVGA graphics. With DESQview, screens are not always restored when you return to a SuperVGA application from a text-based program. Windows restores screens and color palettes correctly. (On a 286 machine, Windows won't switch out of a SuperVGA program at all. To return to Program Manager, you have to quit the DOS application.)

Windows on a 386 can virtualize DOS applications in 132x25 or 132x44 column text modes. This allows you to view extended spreadsheets or documents simultaneously. DESQview's support for small

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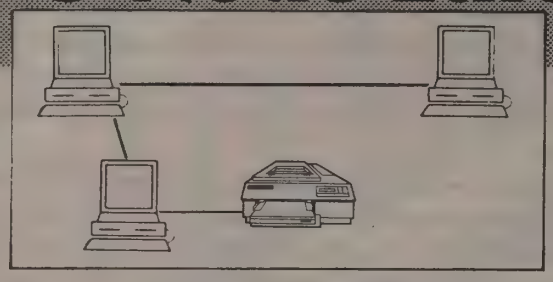

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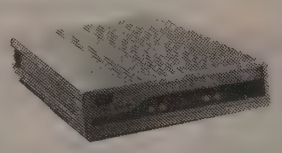

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windows is limited to 80x50 column text. Windows can also be run at 1024x768 resolution, allowing you to view four full-sized DOS windows on the screen simultaneously.

With its support for "virtual paging," Windows can actually provide more memory for concurrent multitasking than DESQview. On a 386 machine, Windows can use the space on your hard disk as additional memory. (Bear in mind that performance slows down considerably when Windows uses disk space as RAM.)

WHO SHOULD USE WINDOWS?

•Users whose primary work is done in Windows applications.

•Users of higher speed 386 and 486 machines who prefer a mouse-driven graphic interface for multitasking and file management.

•Users of 386SX machines who prefer a mouse-driven graphic interface and require limited DOS multitasking.

•Users of 286 machines who must have access to Windows applications and do not require multitasking. These people must be willing to tolerate less-than-robust performance from their Windows applications and should consider upgrading to more powerful hardware. On some systems, DESQview and Windows may be used in conjunction to provide multitasking.

With Windows, so the story goes, novices intimidated by the DOS command line find a new sense of PC empowerment.

WHO SHOULD USE DESQVIEW?

•Users of 8088 and 286 machines who require DOS multitasking.

•Users of lower speed 386SX machines who multitask DOS applications and prefer/require more robust application response. These people may additionally run Windows under DESQview to use individual Windows applications.

•Users who run multiple memory-intensive background applications such as bulletin board systems, spreadsheets, database compilers, etc.

•Users of DOS-extended programs like AutoCAD or Paradox for the 386.

•Users who are more comfortable with text-based, keyboard-driven system management.

THE FUTURE

Subsequent releases of Windows will offer an improvement on its dynamic data exchange. (Microsoft is now calling this OLE—object linking and embedding). Spreadsheets, word processors, and telecommunications programs will be able to update one another automatically. Future versions of Windows will also offer multimedia support for CD-ROMs, sound, and video applications.

Quarterdeck will soon be releasing DESQview-X, an application which permits UNIX X-Windows applications to run under DOS or from remote UNIX workstations. PC users will be able to select MOTIF, Open Look, or other X-Windows graphics front ends as their principal user interface. With DESQview-X, you will be able to run X-Windows applications on DOS machines, or DOS applications on UNIX workstations. ■

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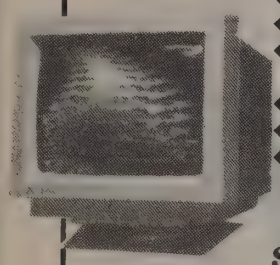

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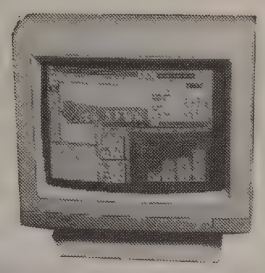

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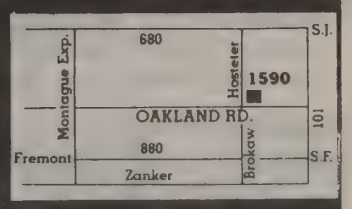

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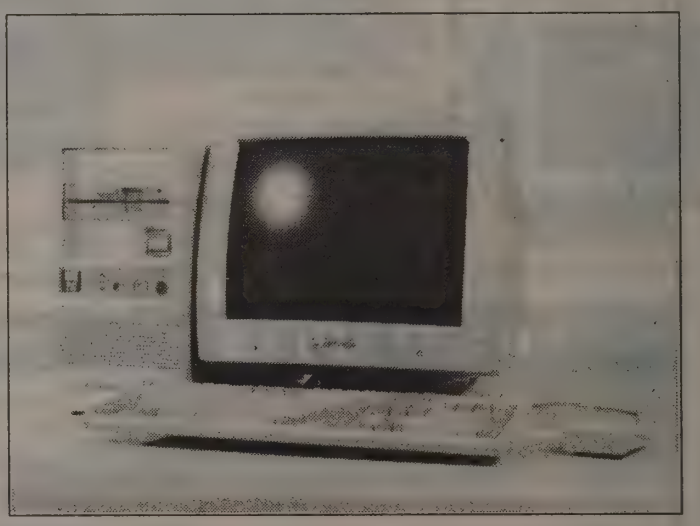

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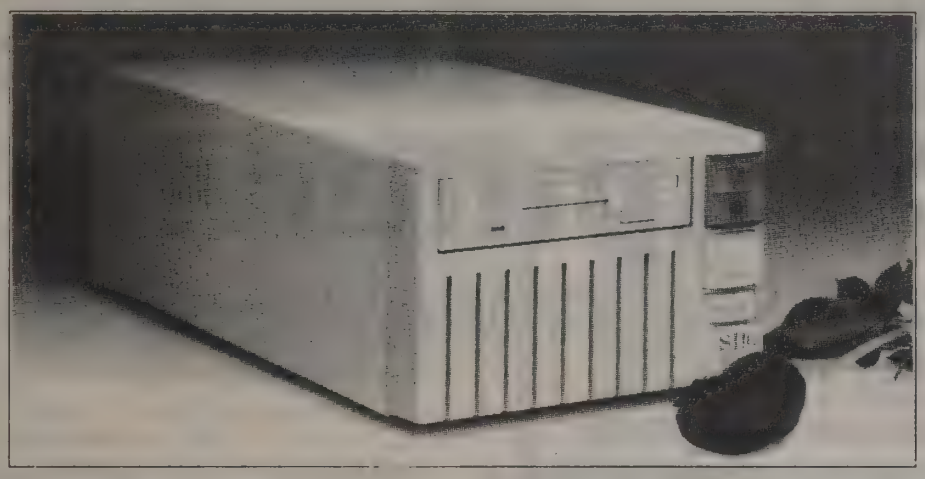

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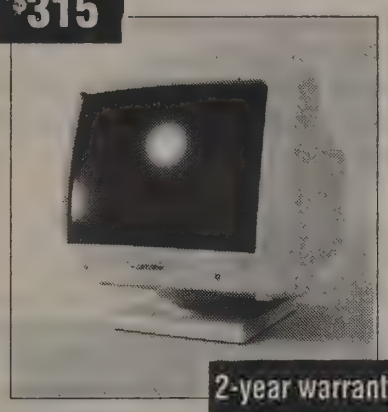

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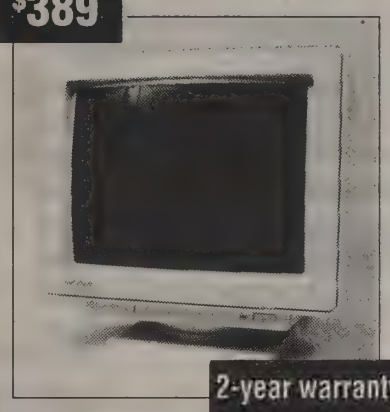

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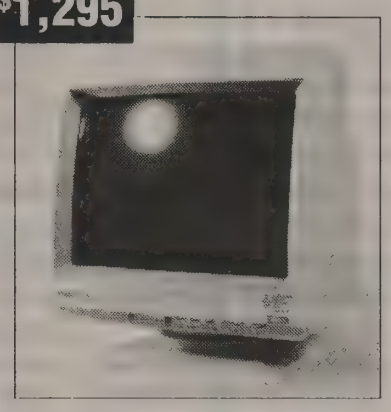

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- CRT Face Treatment: Dark Face, Anti-static-electricity coating
- Recommended Resolution: 1024 dots x 768 lines
- Maximum Resolution: 1280 dots x 800 lines
- Scan Frequency: H: 30 - 64 KHz V: 50 - 90 KHz

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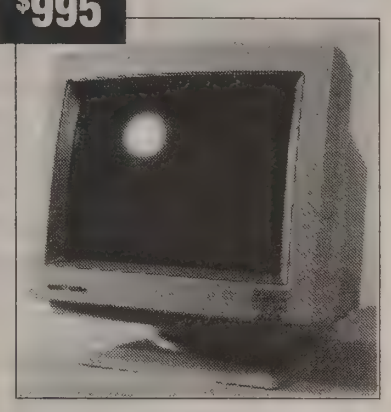

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So You Want To Buy A Computer...

Your First Computer: A Series Of Articles For The Beginning Computer User

BY MIKE MARKOWITZ

A car is much more than a means of transportation, and a computer is more than an information processing appliance. Like a car, a personal computer is seen by many owners as an extension of the self: a friend, a toy, a trophy, a symbol of hope, a substitute for things we have lost. Like the purchase of a new car, the purchase of a new computer, especially one's first, carries a heavy freight of anxiety and stress. With many computers costing as much as a car (at least a Hyundai) this is understandable.

The personal computer began as an expression of the creativity of electronic hobbyists. It evolved as a replacement for two obsolescent mechanical devices: the typewriter and the calculator. If you've never had much use for either of those devices, you won't have much use for a computer. Depending on the nature of your work, a computer can also serve as an endless filing cabinet, a printing press, a drafting board, or a musical instrument. And, of course, it can be connected to the ultimate business tool, the telephone.

WHAT WILL IT COST?

Typical "personal computer" systems range from about $2000 to about $5000, complete. "Complete" means a computer with some software and a printer, ready to run. You can spend more on amazing devices that plug into your computer for input, output, or storage, but if this is your *first* computer—take it slow. You can spend significantly less if your needs are very limited and you know exactly what you want, but that is rarely the situation of a beginner.

A few years back, the choices were more difficult, thanks to a wide variety of incompatible brands and standards. Today the choice is somewhat easier—most probably you want either a Mac or a PC clone. The choice depends on which hemisphere of your brain is dominant. Left-brain people (logical, procedural, orderly, and linear) may be happiest with IBM PC compatibles (also called MS-DOS systems, "industry-standard" computers, and many other things), especially if these are the standard in your workplace. Right-brainers (artistic, creative, messy, and non-linear) will be happier with a Macintosh.

Copyright © 1991 by Mike Markowitz. All rights reserved. *Mike Markowitz is a computer user support specialist for a large Southern California university. He has been writing about personal computing since 1984.*

Reasons for preferring a Mac include ease of setup, learning, and use; consistency (everything works with everything else); and cuteness. The Mac experience is full of clever little things that make beginners smile.

Reasons for preferring a PC compatible include lower cost for equivalent performance, a huge installed base (over fifty million, compared to about three million Macs), and wide acceptance as a corporate standard. Many specialized software programs are available only on PCs. They are also easier to program, something that few beginners are concerned about.

The gap between these two standards is closing—in five years it will hardly matter which brand you use, because everything will be able to exchange information painlessly with everything else. But today we are still quite far from this state of bliss.

THE "LOW-COST" MACS

Macs are more expensive to buy, but often cheaper to own. Don't buy a Mac without a hard disk, unless you plan to add one immediately. There are three models that cover the range of needs of most beginners.

- **The Mac Classic** ($1200–$1400) has a 9" monochrome screen and a very compact design. This is a reasonable choice for students, basic word processing, and small businesses. Performance is slow (if you are used to anything faster).
- **The Mac LC** ($1700–$2400 and up) has a tilted "pizza-box" design, with a separate monitor (color or monochrome). It has one expansion slot, for which Apple has developed a board that lets the computer run Apple II software. Intended for schools and teachers, this is a good home computer of average performance.
- **The Mac IIsi** (around $3000 and up) is a small box with excellent performance. Designed as an all-purpose business system, it has one expansion slot.

The Apple Personal LaserWriter printer, with razor-sharp text and graphics, comes in several models. The low-priced LaserWriter LS is a good choice for users who need to produce a high volume of documents that look really good. The Hewlett-Packard DeskWriter is a less expensive ink-jet printer loved by many Mac users for its reliability, quietness, and compatibility. It is rather slow, however. Apple's new StyleWriter inkjet is roughly comparable to the DeskWriter, but much smaller.

Many home users get along with Apple's ImageWriter, an overpriced, ordinary dot-matrix printer.

THE WORLD OF MS-DOS

IBM PS/2: If it absolutely, positively has to have an IBM label, buy a member of the PS/2

Reasons for preferring a Mac include ease of setup, learning, and use; consistency; and cuteness. The Mac experience is full of clever little things that make beginners smile. Reasons for preferring a PC compatible include lower cost for equivalent performance, a huge installed base, and wide acceptance as a corporate standard.

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family. Avoid the bottom-of-the-line PS/1, which is basically a slick package for the useless Prodigy service. The bigger members of the PS/2 series have excellent graphics and many built-in features. The PS/2 Model 55 SX, priced at about $2,600, is a popular choice.

IBM still supports punched card readers they built in the 1940s. It's hard to argue with that kind of track record.

PC compatibles: Still the "industry standard," these systems fall into three main categories, according to the particular microprocessor chip used. Low-end systems use the Intel 8088 or 8086 chip, mid-range systems use the 80286 or (much better) 80386 SX, and high-end systems use the 80386 and the new 80486 chip. IBM's 8086 machine was called the PC-XT, and the 80286 machine was the PC-AT, and these terms are often used to describe generic "clones."

Along with greater speed and processing power, the higher-end systems have the potential to use forthcoming (and long-delayed) advances in software. PC compatibles can also be classified by manufacturer. At the top of the market are companies like Compaq, AST, Zenith, NEC, AT&T, and many others. In the mid-range are Tandy, many quality mail-order houses (Dell, Northgate), and imports (Hyundai, Vendex). At the bottom are "no-name" clones from Taiwan, Hong Kong, Singapore, and parts East. Prices are low and dealer support is dubious, but quality can be quite acceptable.

Designed for the convenience of programmers, the MS-DOS operating system is not particularly friendly to regular people. The new "graphic user interfaces," such as Microsoft Windows, make PC compatibles work more like a Macintosh, but they require fast, powerful systems with lots of memory.

AMIGA

The Commodore Amiga is a tragic computer. With superb color graphics, stereo sound, and a friendly, flexible operating system, it just never caught on in the mass market. It is still the world's best computer for games. It has wonderful video and animation capabilities (and the Video Toaster/Amiga combination rivals the capabilities of expensive video workstations).

Amiga is as difficult to program as the Mac, and the selection of non-game software is limited. At additional cost, you can add MS-DOS compatibility (to run software written for the IBM PC and compatibles).

Amiga is the choice of many creative artists and musicians, but outside that charmed circle, it has limited prospects.

In five years it will hardly matter which brand you use, because everything will be able to exchange information painlessly with everything else. But today we are still quite far from this state of bliss.

THINGS TO CONSIDER

Whatever brand you choose, you should consider a few issues in advance:

•**New vs. secondhand**—Everyone loves the feeling of unwrapping something new, but previously-owned computers can be a tremendous bargain. Aside from a few mechanical components, like switches and disk drives, there is little inside a computer that wears out. If the silicon survives until the end of a ninety-day warranty, it will probably last for the rest of the century (unless, like me, you keep turning the power on and off many times a day). When you buy a secondhand computer, you usually get a complete system—everything works with everything else. If possible, buy from obsessive-compulsive techno-nerd types, who have carefully preserved all the manuals and packing materials.

•**Color vs. monochrome**—For business applications (word processing, databases, spreadsheets) sharp, legible monochrome is preferable to fuzzy color. You probably will never print anything in

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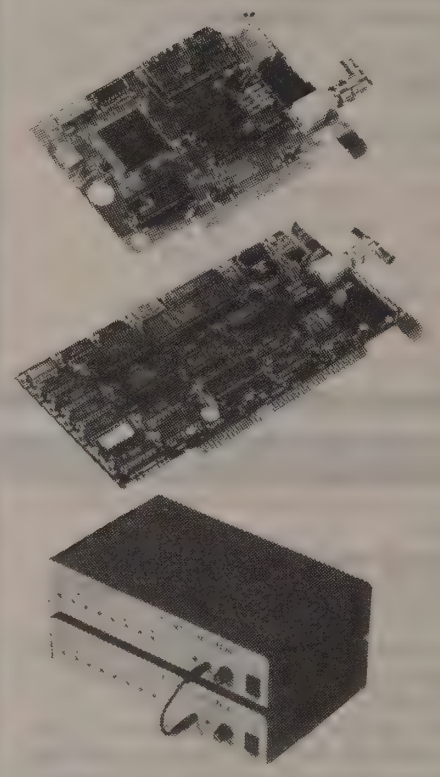

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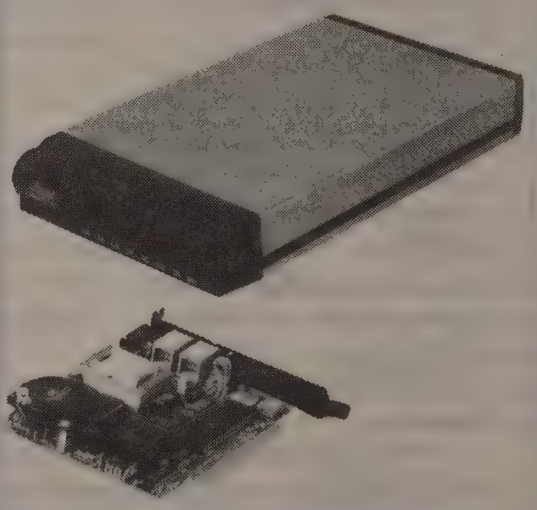

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color—printing in color is either very expensive or very blurry. A good color monitor adds anywhere from 15% to 200% to the total cost of a complete system. You need color if you plan to enjoy a lot of games or educational programs. You probably need it if you are a graphic artist, designer, or architect.

•**Printers**—A common mistake of first-time computer buyers is the "daisy wheel" letter-quality printer, chosen because the output looks like it came from a typewriter. Daisy-wheel printers are noisy, slow, and unable to print graphics. As ink-jet and Laser printers become more affordable, the dot-matrix printer, which has been a computing standard for many years, faces extinction.

•**Mouse vs. keyboard**—If you are not a good typist, the keyboard is the biggest barrier between you and the computer. Pointing and clicking with a mouse (rather than typing commands) can be a big productivity boost. A mouse is essential for any Apple Macintosh, and highly desirable for any computer with software that supports mousing. The trackball, a sort of upside-down mouse, is preferable if your desktop space is tight.

•**Integrated software vs. separate packages**—Do not steal copyrighted software. You should buy it. This is not only morally correct, it provides you with the registration cards and user manuals. It can be costly to buy everything you need separately—word processor, database, spreadsheet, drawing program, modem program, etc. As a beginner, you should consider an integrated software package, such as Microsoft Works (for the Macintosh or PC). The individual modules may not be as powerful as standalone programs, but they can share data, and you get almost everything in one package. Even if you have specialized needs (graphics, accounting, dental office management, etc.), a good integrated package can provide a set of basic, all-purpose tools.

•**How much memory?**—New users sometimes get confused about the distinction between a computer's active memory (RAM chips) and its mass-storage (disk drives), since both are measured in the same units (megabytes) and both influence what you can and cannot do with your system.

To do any useful work, a computer has to load stuff into its memory. This stuff usually includes the operating system (low-level programs that manage how information is received, stored, processed, and displayed) and one or more "applications" (programs like your word processor). To keep a permanent record of your work, a computer has to save a "file" or "document," typically on a disk. This could be a big hard disk permanently mounted inside the computer, or a little floppy disk that you can carry around with you.

Computer memory is measured in bytes. A byte roughly corresponds to one alphabetic or numerical character. The word "humongous" is nine letters long, so as plain text it would take up nine bytes.

As a general rule, the minimum memory configuration of a computer is never enough. Sooner or later, you are going to need more. Some computer designs make it trivially simple for the user to plug in additional memory chips, others make it fiendishly difficult.

•**Portable vs. immobile**—"Laptop" computers are a growing segment of the PC compatible market. They now rival the capabilities of the most powerful desktop units. If you need to travel with a computer, look for the cheapest, lightest model with an acceptable keyboard and display. Battery technology still

Designed for the convenience of programmers, the MS-DOS operating system is not particularly friendly to regular people. The new "graphic user interfaces," such as Microsoft Windows, make PC compatibles work more like a Macintosh, but they require fast, powerful systems with lots of memory.

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ANIMALS (182)-Math for kids.
IQ BUILDER (184)-Test IQ or build one. Great for teaching.
EDUCATE (502)-Disk jammed w/programs to teach kids math, English, Vocab, etc. Requires Basic.
SPANISH (464)-Spanish tutorial w/quizzes, multiple choice, etc.
FRENCH 2 V.1.1 (426)-After the basics, move to the 2nd level of French.
MAP (189)-Learn about the U.S., geography & Capitols. Great Graphics. Requires Basic.
AMY'S FIRST PRIMER (181)-6 delightful programs to teach the alphabet, numbers, shapes, colors, counting, problem solving, & more. Ages 4-8. Requires Basic.

HOME

FAMILY TREE (521)-Explore your family roots, descendants, family groups & more. Fully menu driven.
BIBLE Q (410)-Test your knowledge of the Bible. Great for studies.
RH-MAN V.3.3 (178)-Desktop utility, notepad, etc. Sidekick clone. Very Good!
CITY DESK V.7.1. (177)-Full featured desktop publishing system. Very Good!
PC-CHECK (253)-CheckBook & savings account record keeper.
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PC-RECIPE (462)-Computerize your recipe box. Program will recalculate ingredients.
CROSSWORD CREATOR V.3.30 (442)-Create crossword puzzles for fun or learning. Great for Crossword fanatics.
SUPERMUSIC JUKEBOX (285)-70 plus songs to turn your PC into a Jukebox.

WORD PROCESSING

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WPKIDS (348)-A Word Processor for kids!!!
WORDPERFECT 5.0 MACROS (450)-Disk filled with macros. A must!!
PC-STYLE & PC-READ (352)-Writing analysis program. Helps you write more professionally.
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WORDPERFECT 5.0 TUTORIAL (485,486)-WordPerfect tutorial learning system. Become an expert at WordPerfect!!
SLIC WORKS V.1.0 (525)-Powerful spreadsheet, database, word processor & communications program. FrameWork Clone.

UTILITIES

PD-SIDEWAYS (292)-Prints a file sideways on an Epson printer.
HP SOFT FONTS (298)-Laser fonts for HP LaserJet+.
AT UTILITIES (308)-Very useful utilities for your PC/AT.
BAKER'S DOZEN (311)-Buttonware's 12 best utilities.
AUTOMAXX V.2.2 (309)-Menu system & DOS Manager.
PC-FILE III V.4.0 (319)-Jim Button's file management system. Just about the best!!!
DIRECTORY SCANNER V.3.0 (314)-Xtree clone. DOS Shell.
PRO-MAN (326)-Very good hard disk management program.
EPSONSET (296)-Downloadable fonts for your Epson.
PRINTMASTER TO PRINTSHOP (237)-Convert PM to PS or vice versa.
LASERJET FONTS #2 (376)-Contains 10 point Roman & Helvetica fonts in bold & italic. Includes downloader program.

GAMES

YAHTZEE & PHRASE CRAZE (370)-2 great classics games.
LAS VEGAS (501)-Vegas games of skill.
PACMAN GAMES (432)-Disk filled with great versions of this classic.
STRIKER (212)-Pilot a helicopter and survive. . . Fast paced.
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LAWN MOWER (209)-Mow 6.5 acres in 10 secs. without killing a gopher.
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UNO (215)-Excellent computer version.
ARCADE FUN #1 (434)-Disk jammed with arcade games. Requires CGA.
ALDO'S ADVENTURE (378)-Action arcade games of hazards, treasures, ramps, ladders. Requires EGA or VGA.
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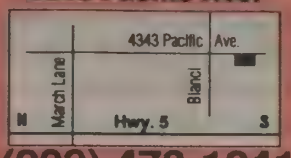

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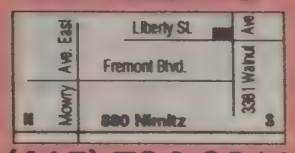

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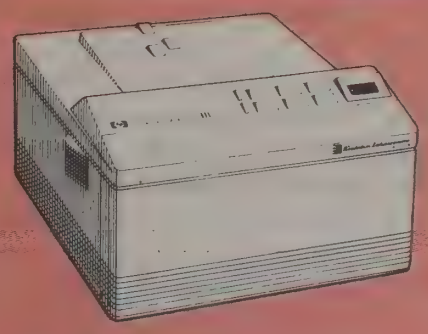

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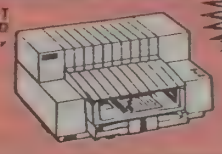

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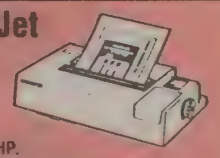

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The Laserless Printhead: Warranteed For 5 Years.

The OL400 also comes with the longest warranty in the industry: 5 years on the printhead, plus 1 year parts and labor on the entire printer. To deliver a warranty that strong, our engineers had to re-invent the laser printer.

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Besides being inherently reliable, the simpler design of the Okidata printhead also means a straight-line paper path that's less likely to jam—even when feeding envelopes, heavy stock, or labels. And, since we build it ourselves, the cost stays low.

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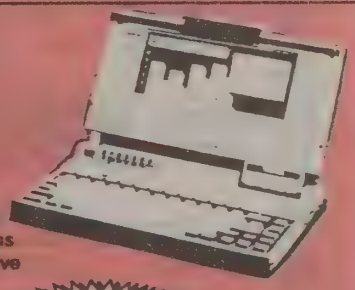

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lags far behind the demands of today's electronics. A removable battery pack may cost extra, but eventually you will be glad you bought it. Nickel-cadmium batteries store a lot of energy, but they have a reputation for crankiness, and you have to follow the recharging instructions meticulously. An internal modem and a 3.5" disk drive are valuable features. If you really need a portable computer, then you probably need a battery-operated portable printer as well.

•**Do I need a modem?**—Could you live without a telephone? Neither can your computer. A modem gives you access to the world of bulletin boards, electronic mail, and other wonders. Computer telecommunication is hard to learn, and it helps to have a friend to help you over the rough spots. The speed at which a modem sends or receives data is expressed in "baud," which roughly means bits per second.

Modems can be internal or external. External modems are preferable if you need to share one modem among several computers. Don't waste money on anything slower than 2400 baud or faster than 9600 baud. Some modems now offer fax capability at a small additional cost.

ABOUT PERFORMANCE

Back in the days when cars were sold on the basis of engineering, rather than feeling good, car advertising relied on numbers that were supposed to have something to do with performance:

Horsepower
Engine displacement
Acceleration
Torque
Stopping distance (for safety wimps)
Miles per gallon (for ecology wimps)

When you look at computer advertisements, you see a bewildering profusion of exotic numbers that are supposed to describe performance:

Clock rate (in megahertz)
Bus width (in bits)
RAM size (used to be measured in kilobytes, now in megabytes)
Memory access time (in nanoseconds)

Buyers pay fabulous amounts of money for bragging rights to performance increments that are almost undetectable without sophisticated test equipment and benchmark software. These numbers are tremendously important and exciting to electronic engineers, but they are curiously unrelated to the way users actually experience performance:

How long do I have to wait to start up my word processor?
How long will it take to save my document?
How long will it take to print out my term paper?

Actual computing (the stuff that computers do electronically) is pretty much instantaneous, even on old, slow computers. A computer spends most of its life impatiently ticking off the nanoseconds waiting for a human to press another key. The delays that users experience are mostly related to dumb mechanical stuff—motors, gears, and levers in disk drives and printers. In the long run, a good, fast printer and a fast, reliable hard drive will make you happier than a box of hyper-turbo-warp speed silicon that spends most of its awesome clock cycles just sitting there, idling.

IN CONCLUSION

No material possession is going to change your personality. If you aren't well-organized, a computer is not going to make your life any more orderly. You may learn things from using a computer, but (being incredibly dumb itself) it will not make you any smarter. It may entertain you. It may help you to do some useful work. It will take up a lot of physical space in your home, and even more psychic space inside your head. That's all. ■

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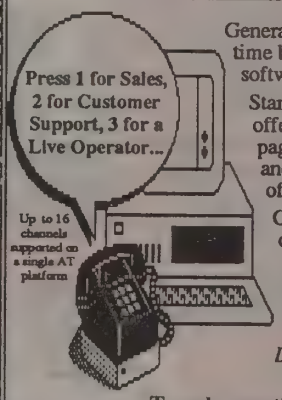

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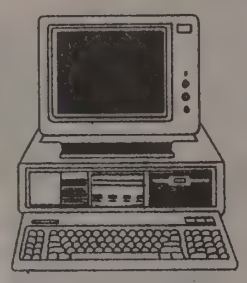

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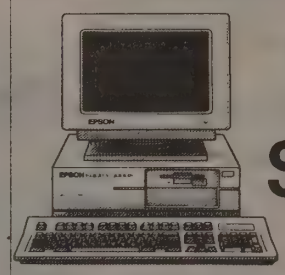

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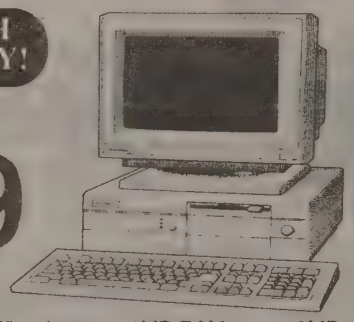

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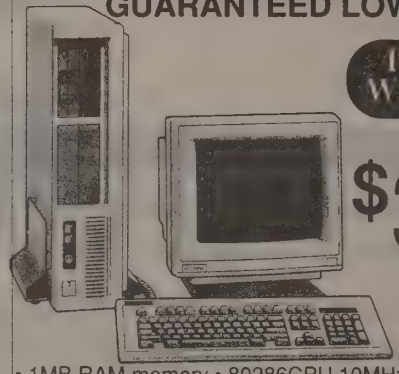

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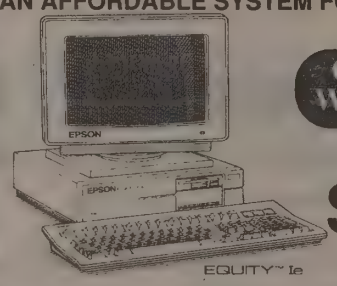

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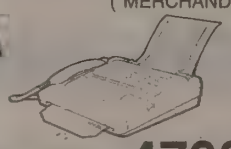

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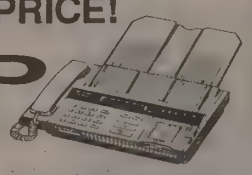
• 16 grey scale
• Built-in telephone

TOSHIBA TF251	$789
TOSHIBA 4400	$499
TOSHIBA4600	$629
OKIFAX 700	699
SAMSUNG FX1100 GREAT PRICE!	399
SAMSUNG FX 2310	529

SHARP

FO-216



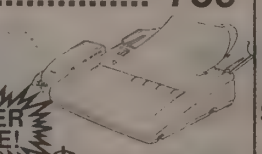
$589

• Auto cutter
• Auto fax/phone switch
• Answering machine hook-up

SHARP FO-120	$449
SHARP F0-240	$699
SHARP F0-334	$789

MURATA M1100

LOWER PRICE!



$389

•Automatic Paper Cutter
•Advanced calling features
•Automatic multi-page feeder
•Secondary phone connection

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LOGITECH MOUSEMAN™

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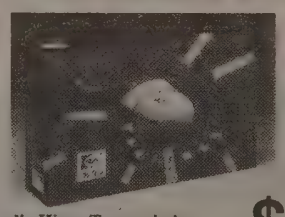
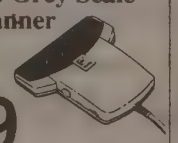


$138

• Cordless, Radio Wave Transmission
• Microsoft compatibility
• PLUS 3-button funtionality
• 400 dpi resolution
• MouseWare™ Utilities software
• Guaranteed to work w/ all your application software

ScanMan

Model 256 Grey Scale Scanner

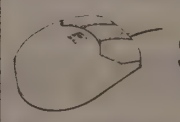


$299

• 100- 400 dpi adjustableres
• Ansel Image Editing & SoftMate software
• 256 grey scale

MOUSEMAN™

HIGH RESOLUTION
ERGONOMIC MOUSE



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• Maximum comfort & ease of use
• Microsoft compatibility PLUS 3-button functionality
• 400 dpi resolution
• MouseWare™ Utilities software

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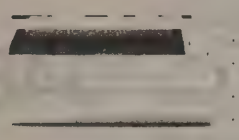

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• Built-in Roman and SansSerif fonts
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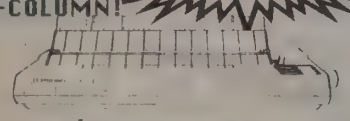

$229
• 264characters per second
• 240x216 dpi resolution • 9-pin printer • 1 year warranty

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LQ-1010 136-COLUMN!
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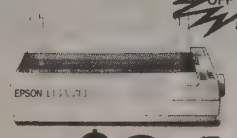

$249
• 264characters per second
• Built-in push tractor feed • 24-pin printer •1 year warranty

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LQ-850 80-COLUMN!
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$299
• 264characters per second
• Built-in push tractor feed • 24-pin printer •1 year warranty

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FX-1050 136-COLUMN!
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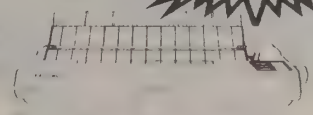

$329
• 264characters per second
• 240x216 dpi resolution • 9-pin printer • 1 year warranty

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LQ-1050 136-COLUMN!
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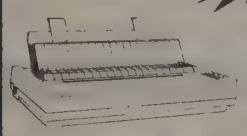

$429
• 264characters per second
• Built-in push tractor feed • 24-pin printer •1 year warranty

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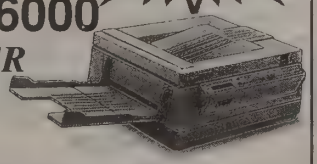
SAVE $145 OFF ORIGINAL SALE PRICE

EPL-6000 *LASER*



$555
• 300X300dpi resolution • 6 ppm
• 6 resident fonts •512K exp. to 4.5MB
• EPSON's 2 year limited warranty

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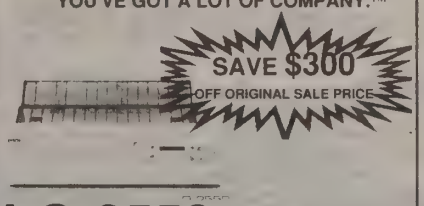

LQ-2550 COLOR
$599
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• 360x360 dpi resolution • 24-pin printer• 7 resident fonts • 1 year warranty

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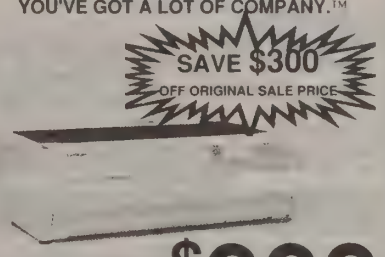

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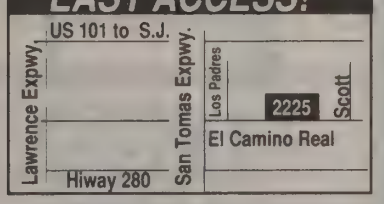

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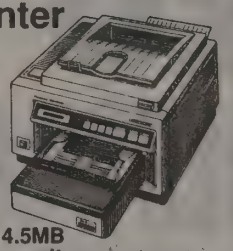

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- 300 dpi resolution • 8 PPM

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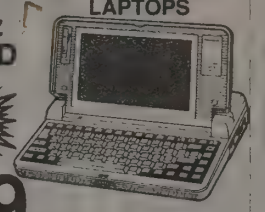

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- 1M exp to 5MB • Backlit supertwist LCD
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- Rechargeable batter pack
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C1381

MAC & IBM COMPATIBLE

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- Super VGA Monitor
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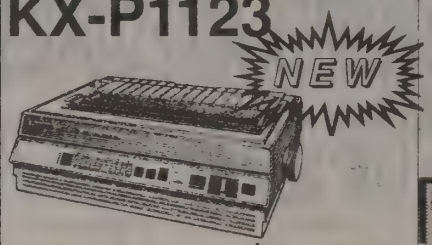

- 192cps, 63cps LQ
- 5 built-in LQ fonts
- 2 year warranty

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- 240x216 dpi resolution
- 80 column printer

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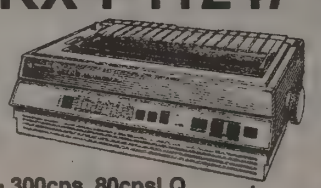

- 300cps, 80cpsLQ
- 8 built-in LQ fonts
- 2 year warranty

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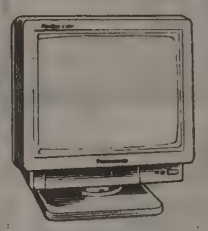
KX-P1524 .....$359

14" Multi-Frequency Color Monitor



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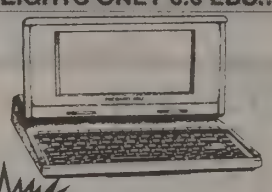

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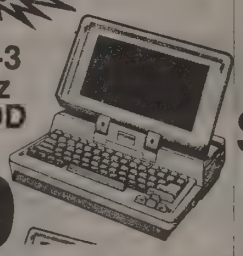

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- Supertwist backlit LCD screen
- Serial/parallel ports • MS-DOS 3.3

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w/ 20MB HDD
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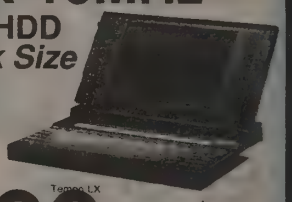

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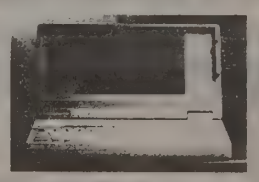

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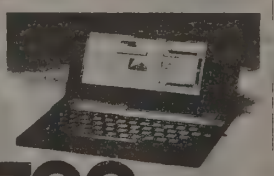

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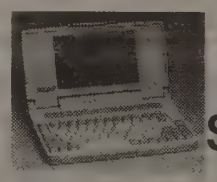

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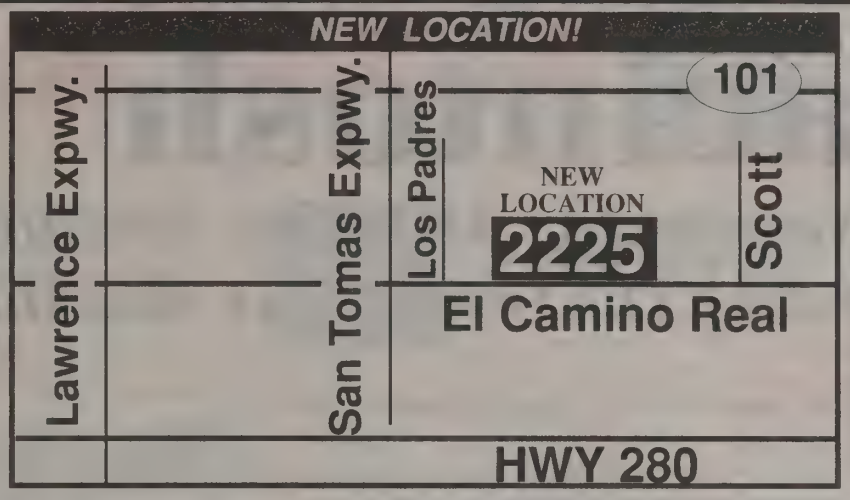

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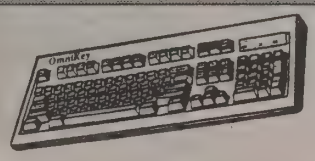

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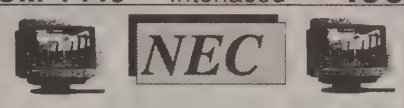

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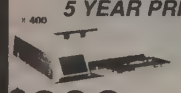

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•200 Sheet paper tray
•4ppm, 300 dpi
•HP Series II compatible
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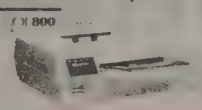

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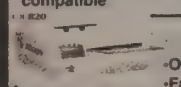

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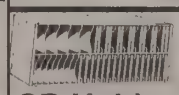

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WordPerfect 2.0 For The Macintosh

This New Version Adds New Features, Expanding The Uses Of The Mac Dialog Box

BY MIKE MARKOWITZ

WordPerfect dominates word processing on PC's and compatibles, but has had no luck with the Macintosh. Microsoft Word got an early death grip on serious Mac word processing, and through four successive versions has never lost it. The original version of WordPerfect for the Mac was late in shipping, had nasty bugs, crashed relentlessly under MultiFinder, and many users found the "look and feel" of the program distinctly un-Mac-like (which is the worst thing a Mac user can say about a program). MS-DOS WordPerfect (now up to v5.1) has a minimalist user interface hiding its power behind a blank screen. It uses nested menus and arbitrary function key combinations for its commands. If you use the program six hours a day for a few months, it all becomes habitual, and very efficient. But Mac users expect pop-up menus, dialog boxes, standard keyboard shortcuts, embedded graphics, and all the furniture of the Holy Desktop Interface.

WordPerfect did not become a big corporation by ignoring what users want. With v2.0, it gives Mac users what they want. And then some.

This is a big program in a big box containing five disks. The application is 959K, plus 577K of excellent online Help and 375K for the Dictionary. An Installer puts it all together on your hard disk. You can customize the installation to fit the amount of memory in your computer. Under MultiFinder, the program can run in as little as 800K. There are also extensive Tutorial files and a Thesaurus.

Documentation includes a Getting Started booklet, a tutorial workbook of twenty lessons, a 500-page command Reference manual, a Drawing manual, and a 420-page Macro programming manual.

USING WORDPERFECT

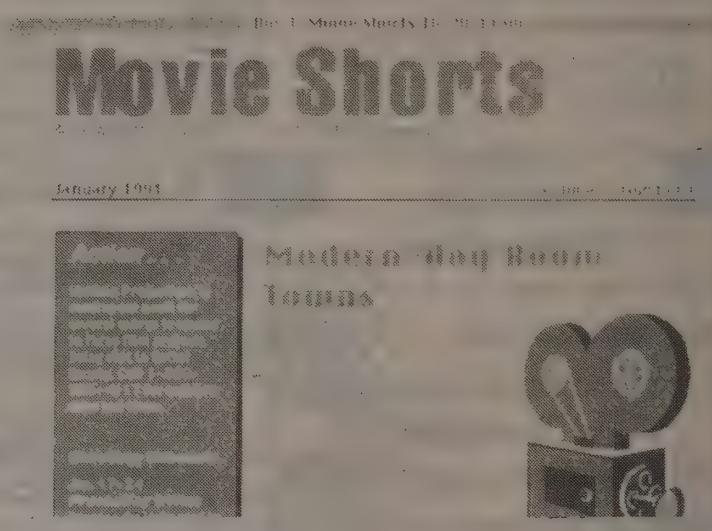
WordPerfect expands the familiar conventions of Macintosh dialog boxes. The File Manager lets you create, delete, and rename folders; copy, print, or rename documents; and search for specific words or phrases without having to leave the program. Many users will appreciate the Character Map, which displays a window containing every character of your currently selected font—simply click on a character to drop it into your document at the insertion point.

The Ruler bar in WordPerfect 2.0 has its own pull-down menus for Tabs, Columns, Alignment, Zooming, and other frequently used functions. To copy the current Ruler settings to the Clipboard, you click on a Clipboard icon, and a little animated ruler jumps onto it. Multi-column layouts are very easy to set up and customize.

WordPerfect 2.0 has a drawing module that supports up to 256 colors, with a color palette that allows fancy mixing, blending, and gradient effects. The tools include Bezier curves (a flexible, editable curve that many Mac graphic artists demand). There is a floating palette of drawing tools—a great convenience on large screens.

A graphic can be treated like a character, so it will move as the surrounding text is edited, or it can be locked in position on the page,

Continued on page 139



In many ways, WordPerfect 2.0 for the Mac is a hybrid word processor/page layout program. You can easily create free-floating text boxes, with many border and fill options. Sidebars, text callouts, and other special effects are easy to create and modify. The ability to crop and resize graphics is remarkable in a word processor.

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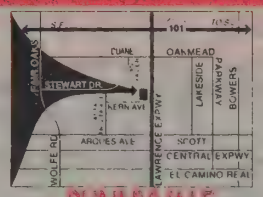

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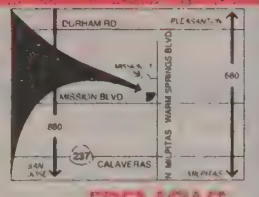

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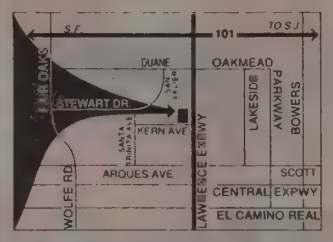

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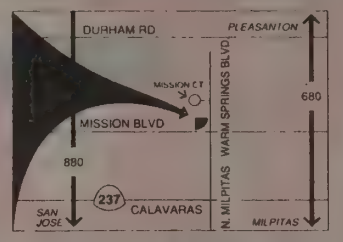

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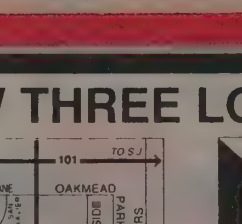

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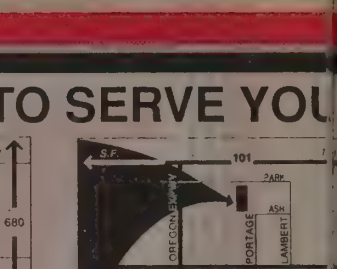

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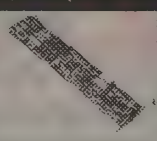

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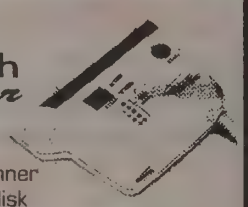

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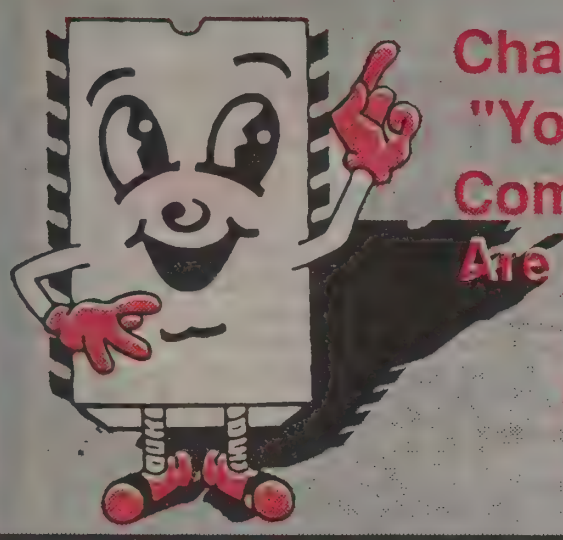

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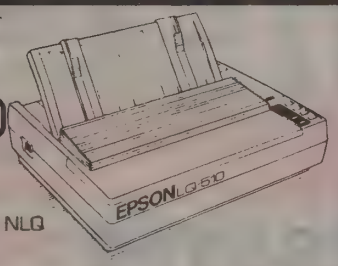

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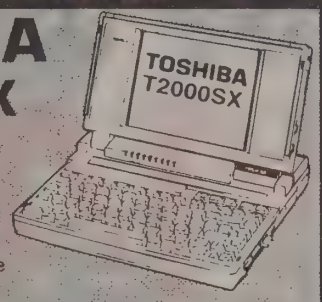

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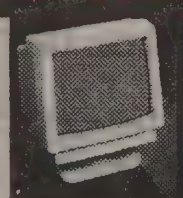

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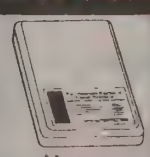

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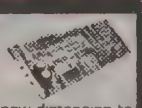

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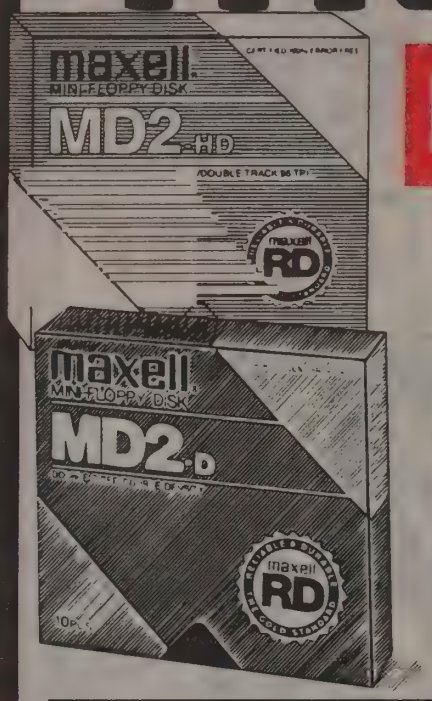

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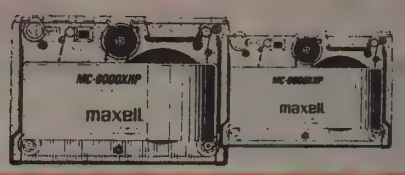

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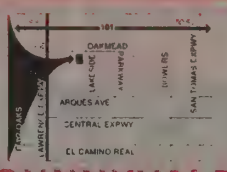

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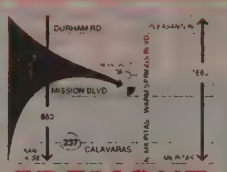

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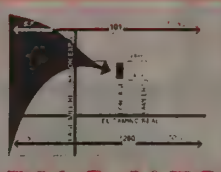

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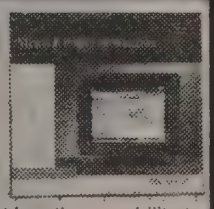

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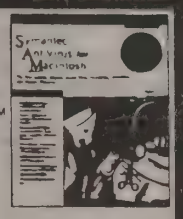

The Norton AntiVirus is a comprehensive solution for preventing viruses from infecting your PC. It also detects existing infections or irregularities in your files that could signal an unknown virus at work.

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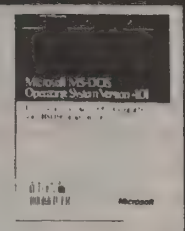
Microsoft MS DOS



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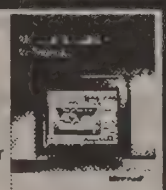

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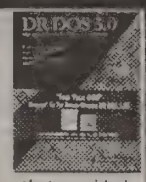

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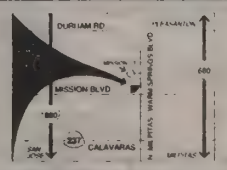

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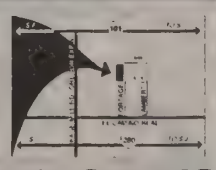

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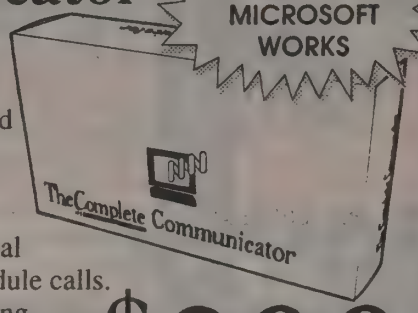

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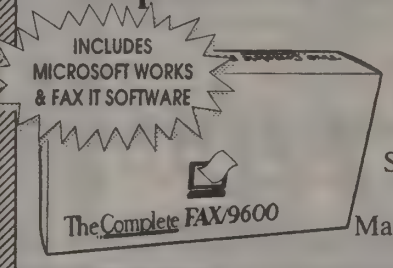

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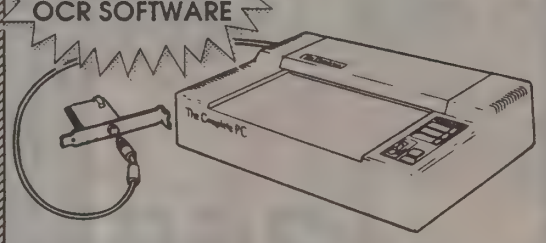

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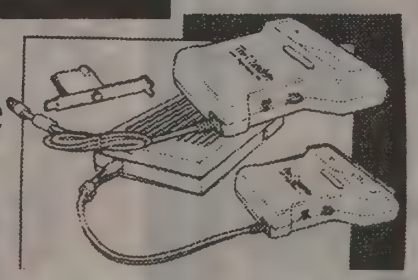

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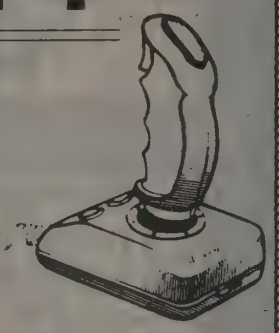

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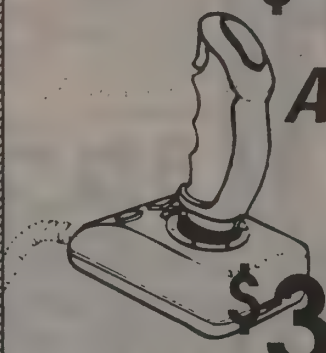

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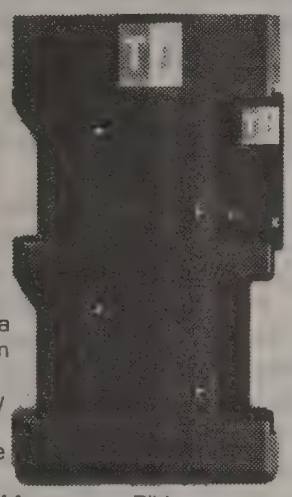

Bitstream's new font cartridge brings together a brand new collection of award-winning Bitstream type in many sizes and more variety then any other cartridge. You can add more typefaces by plugging in low cost add-on cards into the four expansion slots on the base cartridge. The base cartridge includes one free add-on card to give you the following type: Swiss, Zapf Calligraphic, Monospace, Ribbon, Cloister Black, Letter Gothic, Swiss Condensed, Old Dreadful and Symbols. Point sizes range from 7 point to 36 point depending on the typeface. Typecity works on your HP LaserJet II, IIP, III, IIID and IIIP printers or compatible. Matching screen fonts are included for Microsoft Windows 3.0.
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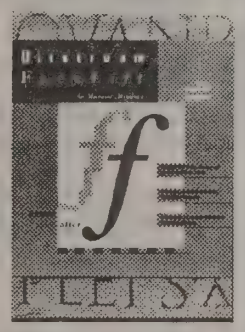

FaceLift is a type tool for all popular windows applications. It is fast, easy to use and makes great fonts for your screen and printer. FaceLift comes with 13 different fonts that will give you professional looking documents instantly. It scales typefaces to any size, automatically
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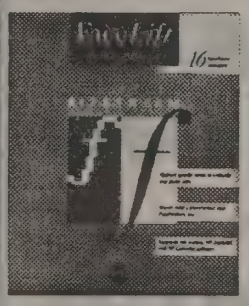
Bitstream Bitstream Bitstream Bitstream Bitstream Bitstream



FaceLift
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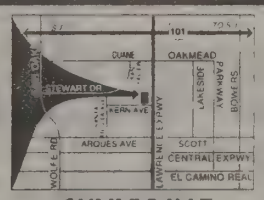

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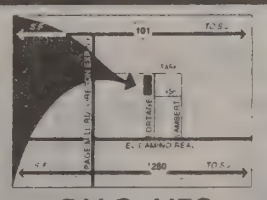

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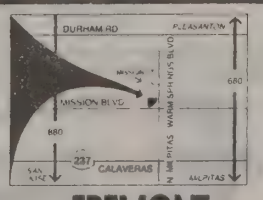

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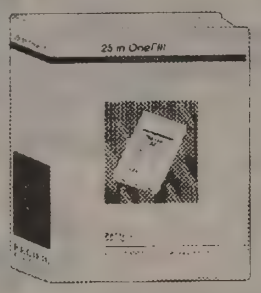

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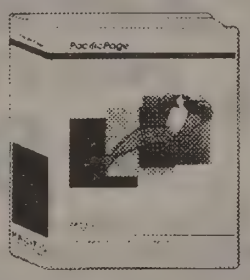

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Pacific Page PE for MAC PostScript Language emulation cartridge for the LaserJet Series IIP, IID, III and IIID when used with the Apple Macintosh. Provides Macintosh users with a low cost, easy to use alternative to expensive PostScript printers. Includes cartridge,AppleTalk interface and printer drivers. #1545382

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Plotter in a Cartridge PE Emulates HP-GL on the HP LaserJet Series IIP, IID, III, IIID and IIIP Produces precise, high resolution graphic in a fraction of the time required by pen plotters or PC-based emulations. #1490576

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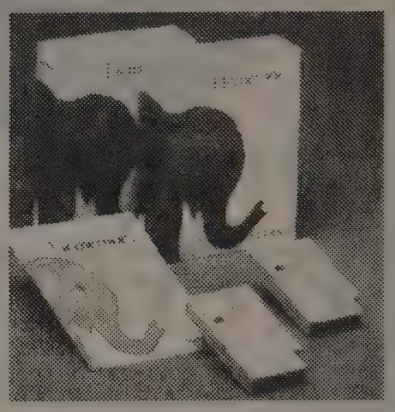

Elefont Cartridges Plus gives you 2 Cartridges, an Elefont Desk and Headline, with all the fonts you need without swapping cartridges. This ultracartridge set conveniently prints everything from 30 point headlines to 5 point footnotes in a choice of four typefaces: CG Times*, CG Triumvirate*, Letter Gothic** and Prestige Elite**. #1528404

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Elefont Desk Cartridge is ideal for professional business correspondence. CG Times, CG Triumvirate, Prestige Elite and Letter Gothic ranging from 5 to 16 points bold, medium and italic . . . #1528390

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Elefont Headline Cartridge. If you do big presentations or just need big type, this cartridge has 30, 22 and 15 point headline sizes in both CG Times and CG Triumvirate. Plus you get 11 point type, the size PC Magazine calls "the ideal" for word processing. You can print math and scientific symbols, too. . . #1528415

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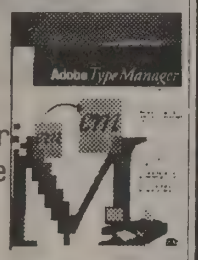
Adobe *Type Manager*



Adobe Type Manager software from Adobe automatically cleans up jagged or stick figure text on your screen, as well as text printed from dot matrix, ink jet and laser printers. ATM is available for both Macintosh and Windows 3.0 and comes with the 13 most popular typefaces.

Windows #1540664
MAC #1491913

$62.99

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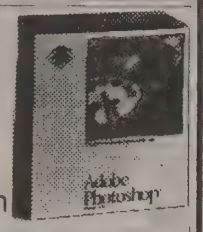

Starting from scratch or a scanned photo, if you can imagine it, Photoshop can produce it. Photoshop is MacUser magazine's Software Product of the Year and allows you to create or manipulate any image in 24 bit color, grey scale or black and white.

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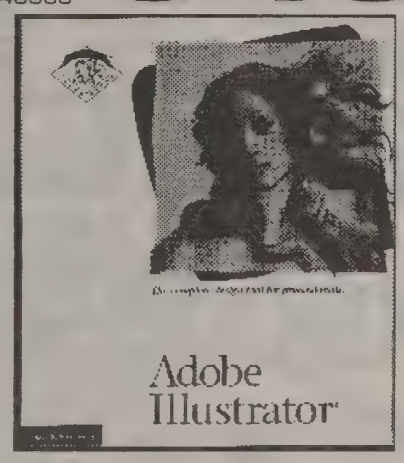
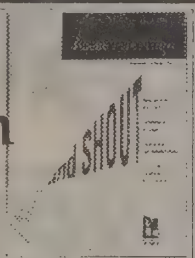


Adobe TypeAlign



There is no easier way for Windows or Macintosh users to print in shapes or around curves than with Adobe TypeAlign. TypeAlign not only lets you place type along a path, but also allows you to stretch, skew or distort the path and have your type automatically conform to whatever you do to the path. TypeAlign also allows you to use whatever you create in any Windows or Macintosh program that supports pasted or placed graphics. TypeAlign requires Adobe Type Manager and works with most printers supported by Macintosh and Windows and any PostScript printer.

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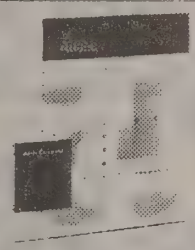

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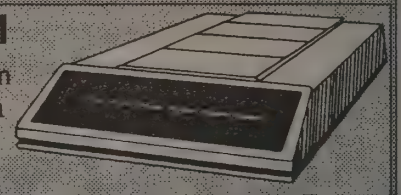

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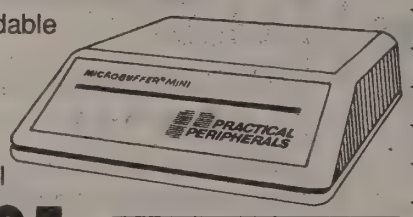

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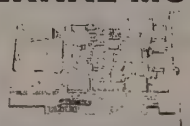

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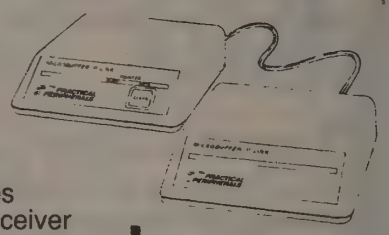

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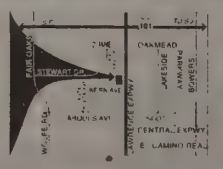

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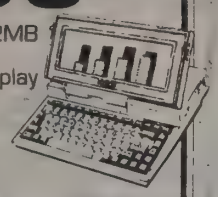

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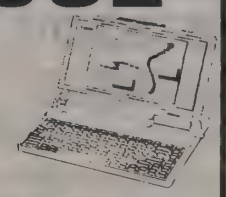

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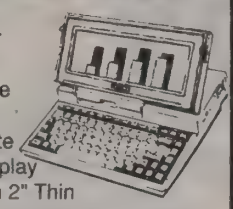

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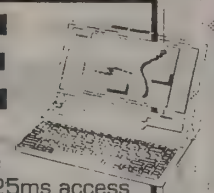

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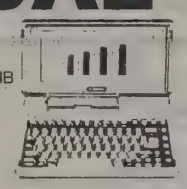

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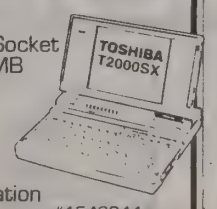

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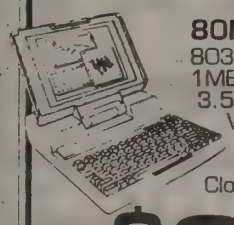

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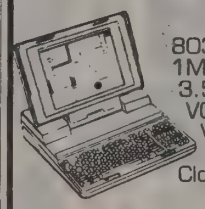

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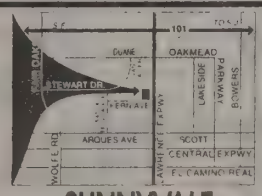

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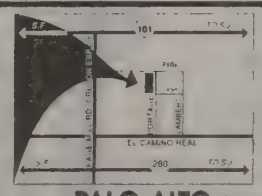

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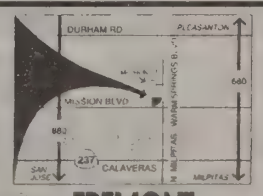

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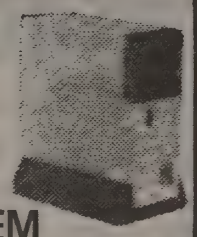

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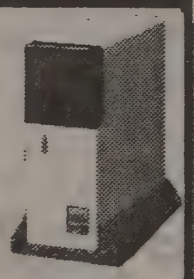

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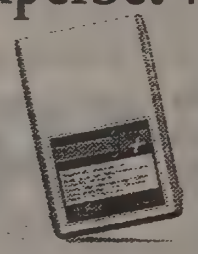

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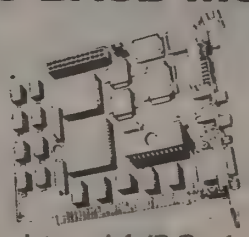

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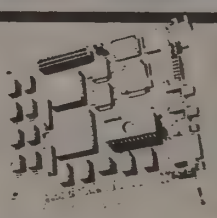

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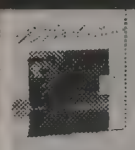

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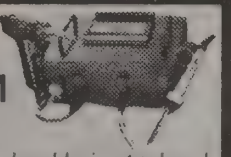

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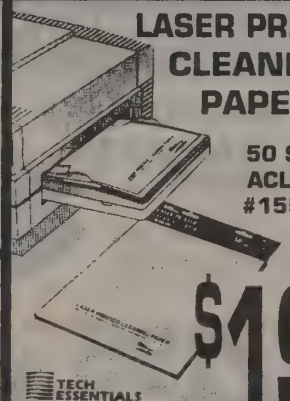

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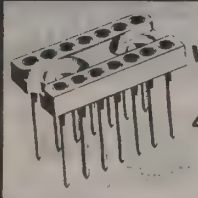

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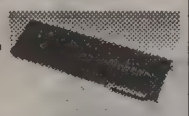

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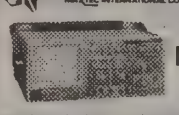

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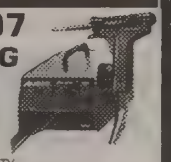

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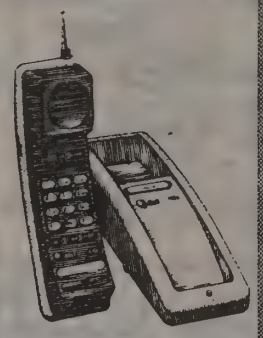

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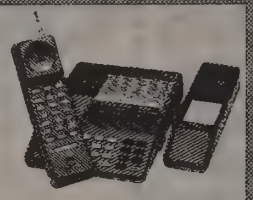

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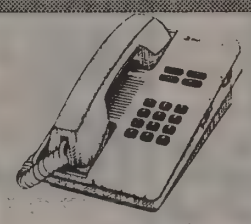

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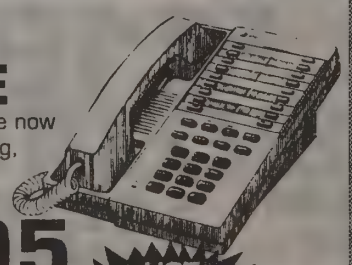

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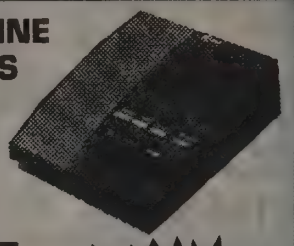

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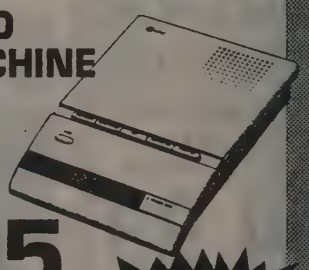

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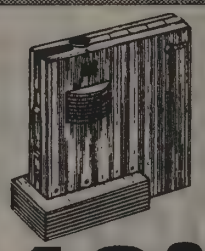

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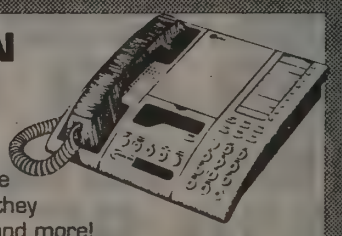

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#1516203

VOICE TIME/DATE STAMP

Continued from page 124

so that text will flow around it. A unique feature is "watermark," which places a graphic "behind" the text. The default treats a graphic as an overlay—like a transparent sheet placed on top of your text. There is a disconcerting visual effect when you type "through" a graphic: your line of text appears to push part of the picture to the right. The screen is updated correctly when you stop typing.

A unique feature is "watermark," which places a graphic "behind" the text. The default treats a graphic as an overlay—like a transparent sheet placed on top of your text.

In many ways, WordPerfect 2.0 for the Mac is a hybrid word processor/page layout program. You can easily create free-floating text boxes, with many border and fill options. Sidebars, text callouts, and other special effects are easy to create and modify. The ability to crop and resize graphics (something very difficult for a programmer to implement smoothly) is remarkable in a word processor.

You can insert PostScript printer language commands directly into a graphic. The code is typed into a dialog box, the PostScript object appears as a box labeled PS on the screen, and the commands are executed during printing to a PostScript device.

The Macro feature in WordPerfect is a powerful programming language that can be used to automate complex tasks. Macros can

How to Install the Conversion Utilities:

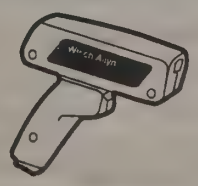
After opening this file in WordPerfect 2.0, go to the Librarian feature found under the File Menu. Once the librarian dialog is open, select "Conversions" in the Resource pop-up in the top left corner. The conversions that are currently installed in WordPerfect are shown in one of the two windows of the Librarian. The other window shows those conversions that are contained in this document that can be installed in WordPerfect. Select one or more of the conversions that you want to install and click on the copy button. The selected conversions are copied into your private library. Click the done button to exit the Librarian. Until the conversion is removed from your private library it will be available for use.

It should be noted that this ReadMe file includes an elaborate series of tables that document exactly what features each translator can handle.

A later release (2.01) of the program includes translators for Microsoft Word.

WordPerfect does support the emerging Mac standard of Claris's XTND translators, by providing an XTND import filter.

BAR CODE



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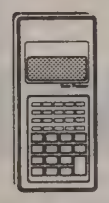

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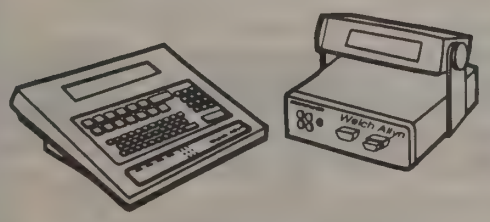

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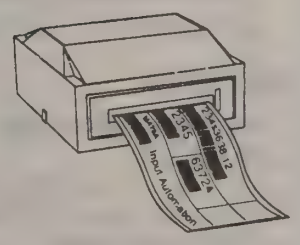

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contain conditional loops, and can execute almost any file management, text editing, or drawing command. It can also be used instead of the Scrapbook desk accessory, as a handy way to store chunks of "boilerplate" text that are frequently reused.

For extended keyboard users, a four-color plastic keyboard template shows the commands assigned to all fifteen function keys. The mapping of commands is not the same as in the MS-DOS version of WordPerfect, since the two versions have such different feature sets. This could be confusing to users making the transition from an IBM PC environment.

The greatest deficiency of WordPerfect 2.0 lies in importing and exporting "foreign" formats. Format translators are provided for standard graphic formats, old MacWrite, MS-DOS and UNIX versions of WordPerfect, and not much else. There were not even any translators for the Apple IIGS, Amiga, or NeXT versions of WordPerfect! The translators are absurdly difficult to install, apparently because they are stored as code resources. The procedure (quoted below) is buried in a ReadMe file, where a novice user might never find it.

WHO SHOULD USE WORDPERFECT

With a list price of $495 (and a street price around $300) WordPerfect should be considered by office users who have a need for heavy-duty word processing, simple desktop publishing, and sophisticated file management. In environments where the MS-DOS version of WordPerfect is the corporate standard, this program could be a connectivity tool for the Mac minority. Programmers will enjoy the advanced Macro features. The Apple extended keyboard or equivalent is highly recommended.

The quality of WordPerfect's telephone support is legendary in the industry. I had no occasion to test this out, since I encountered no problems of any kind using the program.

Hardcore propeller-heads may prefer to wait, to see how the next release of the program supports the new features of Macintosh System 7.0, such as Publish and Subscribe. (WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. 801/225-5000. Fax 801/222-5377) ■

WordPerfect did not become a big corporation by ignoring what users want. With v2.0, it gives Mac users what they want. And then some.

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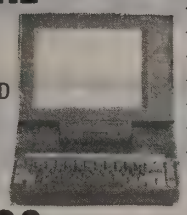

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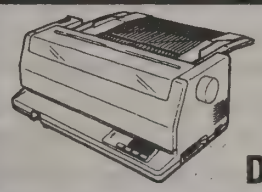

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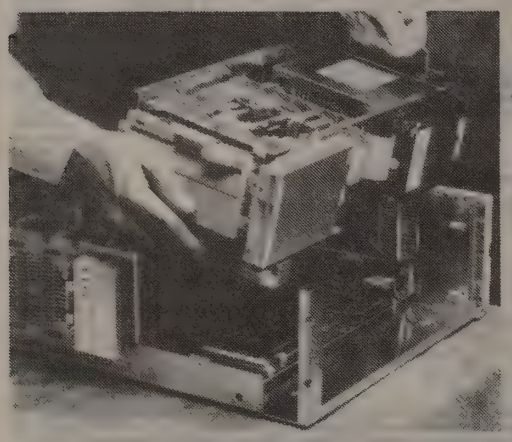


AMKLY INTRODUCES NEW SYSTEMS

The new family of high-performance desktop personal computers from AMKLY Systems reflect founder Albert Wong's (one of the co-founders of AST Research) belief that PCs should be easy to set up, use, upgrade, and service. The AMKLY 386/25E, 386/33E, and 486/25E systems feature a modular architecture and technological advancements designed to meet users' present and future requirements. Based on EISA, or Extended Industry Standard Architecture, the three, small-footprint systems contain the patent-pending Peripheral Platform that holds the 200W power supply and four drive bays. Other standard features include six EISA expansion slots, two serial interfaces, a parallel interface, a pointing device interface, and 1024 x 768 resolution SuperVGA graphics card. AMKLY Systems, Inc., 60 Technology Dr., Irvine, CA 92718. (714)727-0788.

CALIBER COMPUTER EISA TOWER

This 386-33EISA Tower from Caliber Computer is fully compatible with EISA, as well as being fully backwards-compatible with ISA. Rated at 7.5MIPS, this system features six EISA 32-bit expansion slots, two ISA 16-bit expansion slots, up to 16MB RAM, and a tower case with five accessible half-height and two internal full-height drive bays. ($2,695 with 64K Cache and 4MB RAM, $2,895 with 256K Cache) Caliber Computer, Inc., 1500 McCandless, Milpitas, CA 95035. (408)942-1220.

AST PREMIUM II 486SX/20

The AST Premium II 486SX/20, based on the new Intel 486SX processor, includes built-in cache and 4MB RAM, expandable to 80MB. AST developed its own ASIC (Application Specific Integrated Circuits) to allow a high level of

Continued

PRODUCT UPDATES

➤**Go Technology** has introduced two new versions of **HOT KEYS**, a predefined F-Key macro system for the Macintosh. The two products add **Aldus PageMaker 4.0** and **Personal Press 1.0** from Silicon Beach Software to the list of applications supported by HOT KEYS. A special coupon promotion allows Personal Press users to purchase HOT KEYS at a discount price. Go Technology, Inc., 1-800-468-5391.

➤**Enhance 2.0**, from **MicroFrontier**, is an advanced image enhancements and manipulation software package for the Macintosh. MicroFrontier, Inc., 3401 101st St., Suite E, Des Moins, IA 50322. (512)270-8109.

➤**Nantucket** has released **Clipper 5.01**. The update will be mailed automatically to all registered users of Cippper 5.0 free of charge. Nantucket Corp., 12555 W. Jefferson Blvd., Los Angeles, CA 90066. (213)390-7923.

➤**PSI Integration** has released a software upgrade for its **internal fax/modem cards** for the Macintosh Portable. The manual send-and-receive software increases flexibility and eliminates the need for a second telephone line by using a telephone line splitter. The new software is available free to existing users. PSI Integration, Inc., 851 E. Hamilton Ave., Suite 200, Campbell, CA 95008. (408)559-8544.

➤**Developer's Assistant v2.0**, from **S.L.A.M. Software**, integrates accounts payable into its office management system for software developers. S.L.A.M. Software, Inc., 3202 W. Anderson Lane, Suite 208–176, Austin, TX 78757-1022. (512)834-8927.

➤**Sola** announced **DSP2 Extended Warranty Program**. This program covers Sola units for any failure for one year, including all board level upgrades from the time the unit is repaired, and assures 72-hour or less turnaround. Sola, a Unit of General Signal, Inc., 1717 Busse Rd., Elk Grove, IL 60007-5666. (708)439-2800.

➤**Word Wrapper v2.30**, a source code-based programming tool that brings word processing functionality to Clipper, Fox, dBASE IV, and QuickSilver applications, is now available from **Strategic Edge Software**. Strategic Edge Software, Inc., 3255 Laguna, Suite 8, San Francisco, CA 94123. (415)563-3755.

➤**DataPerfect 2.2**, from **WordPerfect**, adds many new features to this user-friendly database program. Users of previous DataPerfect products can upgrade for $89 to receive the disks and reference manual, or $45 for an update guide and disks only. WordPerfect, Inc., 1551 N. Technology Way, Orem, UT 84507. 1-800-225-5000.

Our Fastest Computer

Uncle Ralph's/Mylex 486-33

Burst Mode EISA Makes This The Fastest 486 You Can Buy!

HERE IS WHY THIS COMPUTER IS SO FAST

A Brand New Technology

This 486 is so much faster than others that it will completely change your expectations. It can format a 350MB hard drive in 5 seconds. It can double network speeds. The secret lies in Mylex's EISA bus.

Burst Mode EISA Bus

Most 486 computers transfer data through the same bus that IBM designed for 286 computers back in 1985. Even though the CPU may run at 25 or 33 MHz, the bus moves data within the computer at just 8 or 10 MHz. EISA is different! It allows data to travel at much higher speeds. And now, with Mylex's special "BURST-MODE" EISA BUS, data can actually travel at CPU speed.

WHAT BURST MODE EISA CAN DO FOR YOU

Instantaneous Hard Drive Accessing

Mylex's fantastic caching SCSI controller holds up to 8 MB of RAM and can reduce average disk access time to an unbelievable 0.2 milliseconds ***(about 75 times faster than today's typical hard drives!)***

Speedier Networking

Super fast processing speed can be wasted if your network can't deliver the data fast enough, but with Mylex's (optional) EISA based Ethernet card installed in your file server, you can double your network's transfer rate.

Faster Screen Updates

Auto-CAD runs blindingly fast with Mylex's (optional) EISA advanced graphics card. Complex screens that take minutes to draw with conventional VGA cards, take just a few seconds. Screens that took a few seconds, now refresh instantaneously.

The Latest Standard

If you want a technology that will hold its place in the market for as long as possible, this is it! EISA is the standard of the future.

Full Compatibility

One of the best things about the EISA bus is that it will accept conventional interface cards. So if you want to get some of the benefits of EISA, but you still want to use your old video card and modem, it's not a problem.

33 MHz 486 with EISA BUS & 256K Cache

Complete System Includes:

- **1024 x 768 VGA Monitor**
- **200 MB Hard Drive**
- **8 Mb System RAM**
- **EISA HD Controller w/4Mb**
- **And ...** 256K Static RAM Cache
- 1 MB VGA Card • Tower Case • 101 Keyboard • 1.2 and 1.44MB Floppy Drives • MS-DOS • 1 Parallel, and 2 Serial ports.

1 Year On-Site Service

$5,995

Financing Available

Optional Component Upgrades

Mylex EISA EtherNet Card ..... + $399

Mylex EISA Adv. Graphics Card .... + $1999

Why Mylex?

In the world of EISA, Mylex is the leader. Their motherboards, and the computers in which they are installed, have earned award upon award for technical excellence.

Why Uncle Ralph's?

Because we've developed the best computer support team in the Bay Area. We do business seven days a week and evenings until 8, so if you ever have a problem, you won't have to wait until normal business hours for help.

What About Price?

Uncle Ralph's is one of the largest Mylex dealers in the country. Not only will we beat the prices of local competitors, but we gaurantee that our price is the lowest available for 30 days after you buy!

2569 Telegraph Ave., Berkeley
(5 Blocks South of U.C.)
Phone:841-5280 Fax:841-4743
Open 7 days: M-F 10-8, Sat & Sun 11-6

Uncle Ralph's

Ad expires 6-18-91. © Uncle Ralph's, 1991

Uncle Ralph's We're As Good

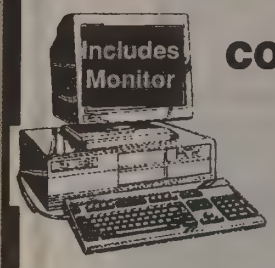
7 GREAT REASONS TO SHOP Uncle Ralph's

1. Lifetime Warranty on Labor
We build our computers to last forever. All parts are covered for one year and our labor is guaranteed for life.

2. Low price guarantee
We'll match any local authorized dealer's price! We'll even protect you against lower advertised prices for 30 days after you buy. We deliver on our promise of low prices!

3. Money back if not delighted
30 day refund or exchange
If your new purchase isn't exactly what you need you can bring it back for a refund, or trade it in for a television, a stereo, or a fax machine! This is Uncle Ralph's, and we must have something you want! Excludes software and consumables.

DTK 286 COMPUTER

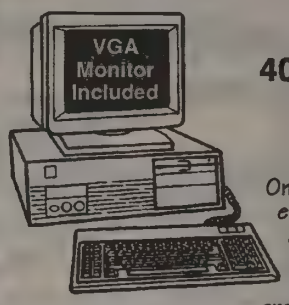


Complete With 40 MB Hard Drive & Monitor

From one of the world's largest computer makers, this IBM compatible comes complete with serial and parallel ports, 1.2MB floppy drive, 1MB RAM, 40MB hard drive, and monitor. Includes DOS, 1 year warranty, and Uncle Ralph's outstanding commitment to customer satisfaction.

COMPLETE SYSTEM **$899** $45/Month

UNCLE RALPH'S/MYLEX 386-SX



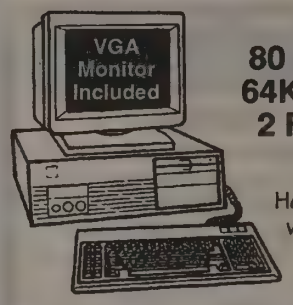
40 MB Hard Drive, 2 MB RAM & VGA Color Monitor

One of the best made computers on the market. This has a dependable & fast motherboard, comes with a great keyboard, and a superbly crafted "accu-fit" case. Complete system includes parallel and serial ports, 2 MB RAM, 1.2MB or 1.44MB floppy drive, fast 40 MB hard drive, VGA color monitor, and Uncle Ralph's excellent support and service.

Complete System Includes MS-DOS & Mouse!

$1499 $75 Month

UNCLE RALPH'S/MYLEX 25 MHZ 386



80 MB HD, 2MB RAM, 64K Static RAM Cache, 2 Floppy Drives, VGA Color Monitor

Here's a lot of computer for a very sharp price. Based on the excellent Mylex 8 layer motherboard with 64K static RAM cache. The system includes a 80Mb hard drive, 2 TEAC floppy drives, enough RAM for high speed compiling and multi-tasking, your choice of excellent keyboards, parallel and 2 serial ports, and VGA monitor.

Complete System Includes MS-DOS & a Free Mouse!

$1999 **$100 Month**

NOTEBOOK COMPUTERS

PANASONIC'S WONDERFUL NOTEBOOK COMPUTER

This tiny laptop is barely bigger than a notebook, but it's fast, fun, and has a new easy to read backlit screen. Includes 640k/RAM, AC adaptor and battery charger, and DOS.

Panasonic Office Automation OA

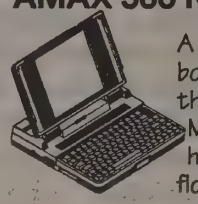
CF150B **$649**

BONDWELL 286 NOTEBOOK WITH 40 MB HARD DRIVE

Light and Powerful

Here's a terrific buy! It weighs only 7 pounds, has a backlit screen, and 40 MB hard drive, and comes complete with an "extra" battery and external charger. **$1299** $65 Month

AMAX 386 NOTEBOOK



A lightweight notebook size computer that goes anywhere. 1 MB RAM and 20 MB hard disk with 1.44 floppy and VGA screen that weighs only 6.5 pounds

In Stock NOW! **$1999** $95/Month

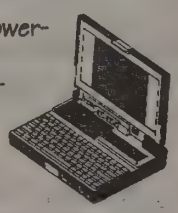
EXCELL 386-SX LAPTOP

Lightweight, comfortable, easy to use and carry

120 MB Hard Drive, Removable keyboard & VGA screen. Includes 2 serial ports, 1 parallel, and the latest version of DOS. **$2499**

with 40 Mb Hard Drive **$2299**

AST SX-20 "PREMIUM EXEC" NOTEBOOK COMPUTER

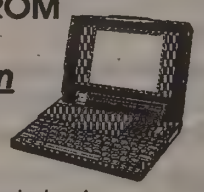


This 7.5 pound, 386 powerhouse fits easily into a briefcase. Do your word-processing, spreadsheet and other computing on the run. 40 MB hard disk, 2 MB RAM, 1.44 floppy, VGA, rechargeable batteries, carrying case and more!

Includes Laplink III

$2899 $145 Month

ULTRA THIN 40 NOTEBOOK COMPUTER FROM COMMAX

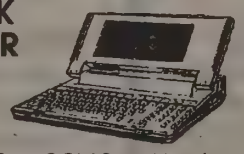


Only 1 1/4" Thin

Unbelievably small and compact, this powerful 386 SX weighs only 4.7 lbs. Includes 1 MB RAM, 40 MB hard drive, detachable 1.44 floppy, VGA, rechargeable battery pack and more!

$2999 $150 Month

TANDON 386-SX 20MHZ NOTEBOOK COMPUTER



This high speed Tandon 386-SX Laptop with 40 or 60MB Hard drive and 2 MB RAM weighs just 7 lbs. It has a VGA Screen and, is expandable to 16 MB RAM.

$2999 40 Mb **$3195** 60 Mb

Closeout Specials

MITSUBISHI - Full Size Laptop, 20 MB Hard Drive, Large EGA, AC Only **$1199**

TANDON TM4141 - Full Size, 40 MB Hard Drive, VGA **$1899**

ALTIMA NSX - Built-in Sendfax, Extra Large Screen and Keyboard **$2599**

TDK DISKETTES

TDK 3.5" 720K	$7.99*
TDK 3.5" 1.44	$16.95*
TDK 5.25" 1.2MB	$9.95*
*Boxes of 10, Lifetime Guarantee	
Head Cleaner	$5.95
Backup Tape Cleaner	$29.95

FAX MACHINES

SHARP

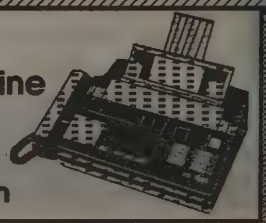
This quality Fax Machine features halftones, 10 page document feeder, phone/fax switch, ans answering machine hook-up.

Works Wth Your Answering Machine

$399 $20 Month

PANASONIC FAX With Answering Machine

Panasonic



$449 $22 Month

As You've Heard

Uncle Ralph's

4. One hour repair service
If you have a problem with one of our computers we can usually have it fixed within 1 hour. It's important to us that our customers remain satisfied.

5. Tech Support 7 days a week
Our Tech Dept. is open for you 7 days a week— til 8 pm Monday through Friday, and til 6 pm on weekends.

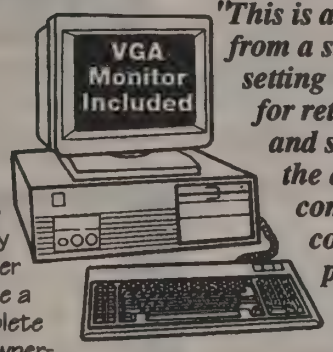
6. 90-day interest-free financing
You can defer payment for 90 days and pay no interest at all! Or you can charge it to your Uncle Ralph's credit card account. Subject to lender approval.
We even take cash!

7. We'll keep you satisfied!
We've been putting smiles on faces for 9 years. We know what it takes to do a good job...and we do it everyday!

"Uncle Ralph's support and service is the best I've seen from any retail store and probably at least the equal of any in the business, retail or mail-order."
Bernie Zilbergeld, *Computer Currents*

Uncle Ralph's/Omnitel 33 MHz 386

Static RAM Cache, 100MB Hard Drive, 4MB RAM, 2 Floppy Drives, 1024x768 VGA Color Monitor



"This is a fine machine from a store that is setting the standard for retail support and service ...Given the quality of the components, I consider the prices excellent."
Bernie Zilbergeld
Computer Currents

The OmniTel motherboard is making some big waves lately and we've packaged it with other excellent components to create a high performance system. Complete system includes hard drive, Viewperfect monitor, 512K VGA card, 2 floppy drives, parallel, game and 2 serial ports, DOS, Mouse, and your choice of excellent keyboards.

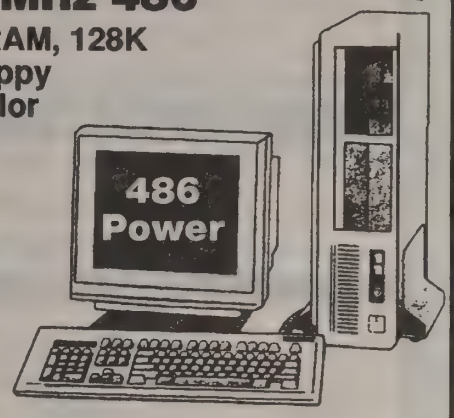
Complete System Includes MS-DOS & a Free Mouse!

$2499
$125 Month

"Super Find"
S.F. Focus Magazine

Uncle Ralph's 25 MHz 486

120MB Hard Drive, 4MB RAM, 128K Static Ram Chache, 2 Floppy Drives, 1024x768 VGA Color Monitor



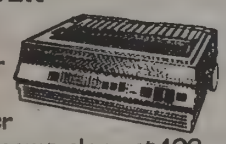
Our latest 486 design incorporates the finest quality components available, carries an excellent price, and includes all of the service and support that Uncle Ralph's has become famous for. Base system includes parallel and 2 serial ports, 101 keyboard, 1MB VGA card, 2 floppy drives, and DOS. It can be custom configured to your exact needs, will handle up to 16 MB of RAM, and it's very fast!

Complete System Includes DOS & a Free Mouse!

$3495
$175 Month

PRINTERS and ACCESSORIES

PANASONIC'S NEAR LETTER QUALITY PRINTER



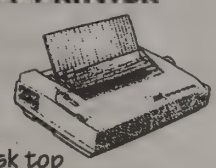
Here's a great buy on our most popular printer. Delivers excellent "near letter quality" print, and zooms along at 192 cps in the draft mode. Incudes automatic tractor feed with paper parking and self loading.

Panasonic Office Automation

$158

2 Year Warranty!
KXP1180

BROTHER'S HI-SPEED NEAR LETTER QUALITY PRINTER



Our fastest dot matrix printer produces text and graphics that are good enough for desk top publishers. It's very fast (370 cps) easy to use, & perfect for high output users.

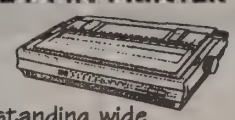
$299
$17/Month

brother

COLOR UPGRADE AVAILABLE $75

PANASONIC WIDE CARRIAGE 24-PIN PRINTER

LETTER QUALITY!



Here's a great buy on an outstanding wide carriage printer. It's easy to use, has excellent "letter quality" print, and an automatic self-loading tractor feed with paper parking. 2 Year Warranty!
KXP1624

Panasonic Office Automation

Call for Best Price

CANON PORTABLE PRINTER

Perfect For Use With Laptop Computer

This tiny (4 lbs..) Bubble Jet prints ink jet quality output. Produce professional looking documents on the run.

$349

Canon

With 30 Page Auto Sheet Feeder & Case **$429**

OKIDATA LASER PRINTER

OKIDATA OL400

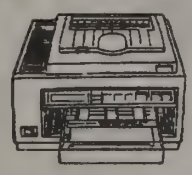
This business page printer produces 4 ppm, 300 dpi publication quality output with crisp blacks, 17 fonts/4 typefaces standard, HP II compatible, 2.5MB of memory available, and parallel interface. Complete with 200-sheet paper tray and more!

Industry's Best Warranty
5 yrs on printhead,
1 yr parts/labor

$699
$35 Month

PANASONIC 8 PAGE MINUTE LASER PRINTER

Panasonic Office Automation



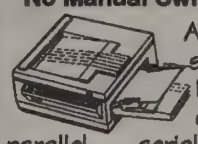
True laser output, 11 resident fonts, HP Laserjet II emulation, 250 page paper tray, 512k RAM. Designed for high output applications, and perfect for busy offices

$849
$42 Month

KXP-4420

SUPERFAST ABATON POSTSCRIPT LASER PRINTER

No Manual Switching Necessary.

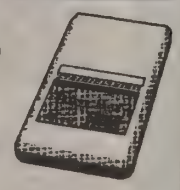


Automatically switches between Postscript and HP emulations, and parallel, serial and AppleTalk interfaces. With 2.5 Mb RAM, this may be the best Postscript buy to date.

EVEREX
PC & Mac

$1599
$85/Month

PACIFIC PAGE FONT CARTRIDGES & MEMORY UPGRADES



- **1 Megabyte Memory Boards** .....$130 for HP Laser Jet
- **Plotter in a Cartridge** $200
- **25-In-One Font Cartridges** .....$230 for HP Laser Jet

Limited to Stock on Hand

GET YOUR UNCLE RALPH'S CREDIT *TODAY!*

✔LOW MONTHLY PAYMENTS!
✔APPROVAL USUALLY WITHIN MINUTES!*
*SUBJECT TO LENDER APPROVAL. MONTHLY PAYMENTS SUBJECT TO INTEREST SURCHARGE. MINIMUM MONTHLY PAYMENT PER ACCOUNT IS $15.00. DOWN PAYMENT MAY BE REQUIRED.

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5 blocks south of U.C.
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open 7 days: M-F 10-8, Sat & Sun 11-6
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Uncle Ralph's
9 Years of Best Prices!

cc,6-4/mt,6-10

Best Prices With Free Installation Service and Delivery For Systems Only

SPECIAL SALE

386SX Computer For as Low as $645

- 386-16SX
- 1 Meg Memory
- 1.2 MB Floppy Teac
- 1.44 MB Floppy Teac
- Mono Graphic Card
- Monochrome Monitor (Hyundai)
- 2S/1P
- 101 Keyboard
- Mini Tower

40 MB HD Add $190
Super VGA System (Monitor & Card) $299
Panasonic 1124 Printer w/System $250
NEC PostScript Laser Printer w/System $1575
Only ten at this price/first come first served

CAD WORKSTATION

- AMI 386-33 MHz, 1.2 MB FD 1:44 FD 64K Cache
- 4 MB Ram
- 150 MB Tape B/U
- 150 MB ESDI Drive
- Super VGA Card 1024x768
- Hitachi 19" 1024x768 Monitor

Best Price

- A-E Size Plotter - Optional
- Houston Inst., Ioline, HP, Roland

COMPUTERS

IBM, APPLE, COMPAQ, EVEREX, AST, SAMSUNG, ALR, TOSHIBA, NEC, PANASONIC AND COMPATIBLES
Call for Best Price and Configuration
Any Computer • Any Configuration

PLOTTERS

CalComp: 1023 A-D $3675
1025 A-E 4775
1044 GT AE 9050
Houstin Inst.: Dmp-61 2975
Dmp-62 3975
IOLINE, ROLAND, HP ..... BEST PRICE CALL

PRINTERS

Okidata 320	$340	Panasonic 1124	$262
Okidata 321	455	Panasonic 1624	365
Okidata 390	475	Panasonic 1524	365
Okidata 391	632	Diconix 150 Plus	335
Star NX1000	189	NEC 6200	475
Star NX1000C	235	NEC 6300	625
StarNR 2410	425	NEC 2200	269

Epson Printers All Models - Best In Town

LASER PRINTERS

NEC, HP, PANASONIC, TOSHIBA, QMS, QUME, APPLE

NEC Silentwriter ..... $1695 *BEST PRICE*

DIGITIZERS

Summa Sketch 12x12 ..... $320
Summa Sketch 12x18 590
Cal Comp 12x12 321
Kurta IS/ONE 12x12 349
Kurta IS/ONE 12x17 595

MONITORS

Hitachi 19" Accuvue $1699
NEC 5D 19" 2195
NEC 4D 985
Nanao 9070S 990
Nanao 9070U 1190
Mitsubishi - All Models ..... CALL
We Carry All Other Models - Call For Lowest Prices

SOFTWARE

Call For Any Software

MEMORY

Call For Latest Prices On
SIMMS, SIPPS, DIPPS, DRAMS, MATH CO.

SPECIAL LIMITED TIME ONLY

- 486 System
- AMI, 486-25 MHz Vouger
- 4 MB Ram
- 100 MB HD, 1.2 MB FD, & 1.44 MB FD
- VGA Card and Monitor

$3395

AMI 385-25 MHz MK III 486-UPGRADE

- 4 MB Ram
- 80 MB HD, 1.2 MB FD
- VGA Card and Monitor

$2590

- Mylex 386 SX
- 2 MB Memory
- 40 MB HD, 1.2 MH FD
- VGA Card and Monitor

$1295

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Minimum Charges

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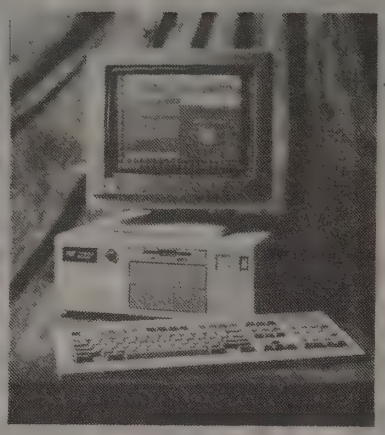
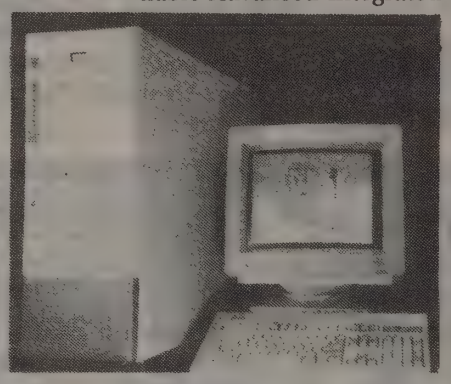
PRODUCT SPOTLIGHT

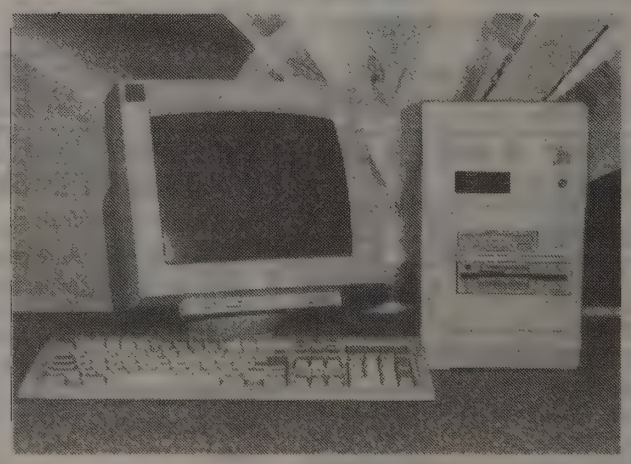


integration on the Premium 486SX/20 system. SuperVGA is integrated on the motherboard with four ports and support for up to three floppy drive devices, leaving five expansion slots available. (A bundled configuration that includes an 80MB hard drive, SuperVGA monitor, factory installed MS Windows 3.0, MS-DOS 3.0, and a Microsoft mouse has a suggested list price of $4,495) AST Research, Inc., 16215 Alton Pkwy., PO Box 19658, Irvine, CA 92713-9658. (714)727-4141.

Z-TECHNOLOGY SYSTEM 486 SUPRA

At the heart of the new ZTS-486 Supra is a reliable Advanced Integrated Research (AIR) motherboard. This 33MHz 486i CPU with AMI BIOS supports a 32-bit EISA bus and features 4MB RAM, eight expansion slots, the Ultrastor hard disk controller with 512K cache, and the Ultra VGA card. ($4,999) Z-Technology Systems, Inc., 441 Grand Ave., S. San Francisco, CA 94080. (415)588-3386.



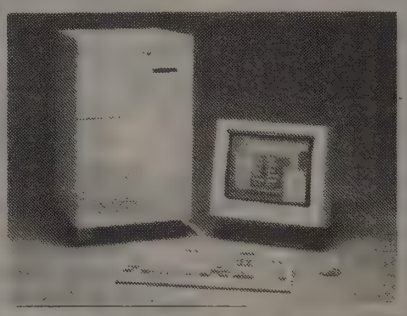


HIGH-POWER AM386DXL WORKSTATION

Forest Neocom has introduced a new series of ISA workstations based on the AM386DXL processor running at 40MHz. This workstation is ideal for the complete range of demanding applications running DOS or UNIX. Total memory is expandable up to 64MB using the company's plug-in memory board. FNC offers a variety of custom display and storage options to compliment the power of its new workstation. The combination of speed and memory capacity makes this new workstation a perfect solution for graphical environments such as Windows 3.0 and SCO Open Desktop. Forest Neocom Corp., (415)234-4FNC.

ACERFRAME 3000 FOR NETWORKING AND MULTIUSER/UNIX USERS

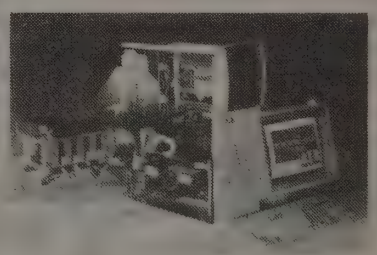
The AcerFrame 3000SP33 is the first in a family of 486-based open system platforms designed for client/server environments.



This fully featured platform provides an ideal foundation for networking, multiuser, and database solutions for demanding business applications. The AcerFrame 3000SP33 has enhanced the 486 processor performance by adding a 128K secondary write-back cache to achieve a system hit rate of 95%. Designed to serve a workgroup of between eight and sixty-four concurrent users, it supports industry standard operating environments, including Novell NetWare, SCO and ISC UNIX, Banyan Vines, and OS/2 LAN Manager. With eight EISA expansion slots it maintains full backward compatibility with the broad base of commercially available ISA expansion boards. ($11,995) Acer America Corp., 401 Charcot Ave., San Jose, CA 95131. (408)922-0333.

ALR POWERPRO ARRAY SYSTEMS

ALR PowerPro Array systems feature ALR's high-speed caching disk controller with 2MB or cache RAM. The PowerPro Array 486/33 family incorporates the new ALR Advanced Disk Array (ADA) controller, a 32-bit EISA bus master controller with 2MB cache upgradeable to 8MB, designed to boost disk subsystem performance, capacity, and disk



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- Real Time Clock/CMOS Memory
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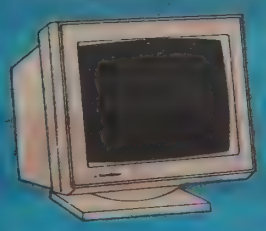

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Oak Chip Set 16Bit VGA Card 65
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IDE Drive Host Adapter/2S1P1G 55
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- MS-DOS manual

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- 3.5″ (1.44 MB) TEAC floppy drive
- IDE FDD/HDD controller
- 2 serial, 1 parallel, 1 game port
- 16-bit VGA card with 1 MB (1024x768x256)
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- 1.2 MB or 1.44 MB TEAC Floppy Drive
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- MGP or 16-Bit VGA Card 1024x768
- 2S/1P/1G
- 200W Power Supply
- Baby AT Case or Mini Upright
- 101 Key Enhanced Keyboard

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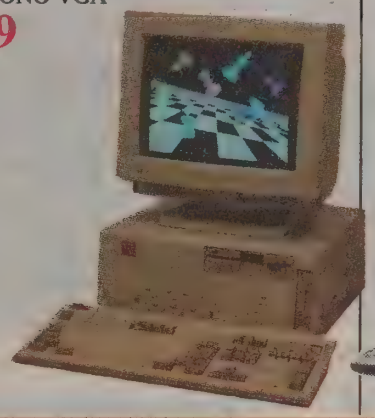

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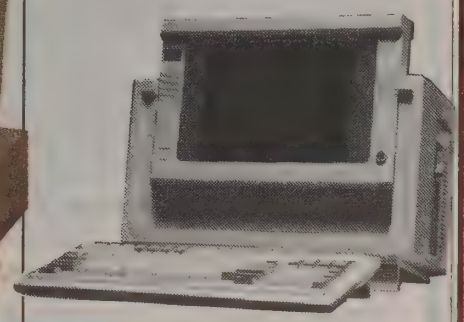

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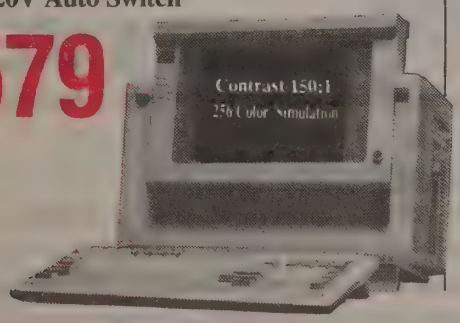

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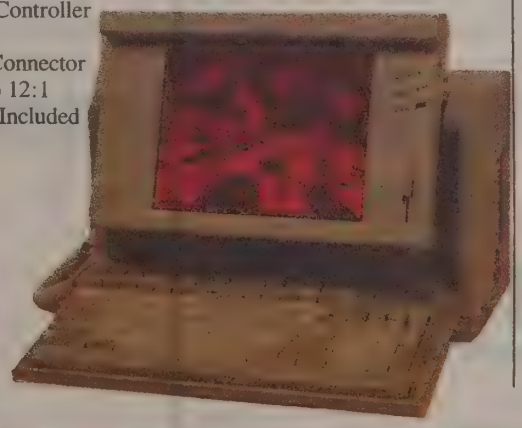

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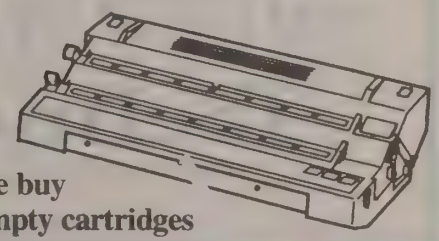

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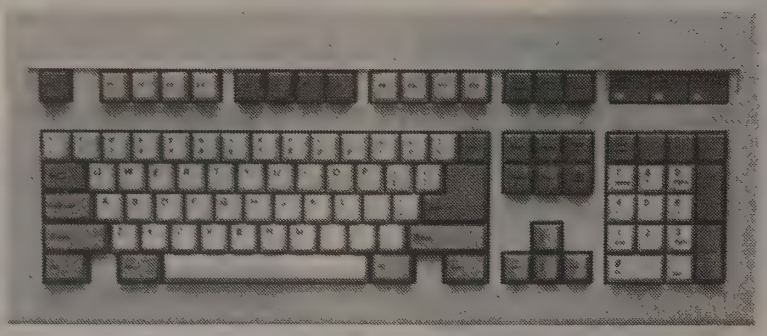

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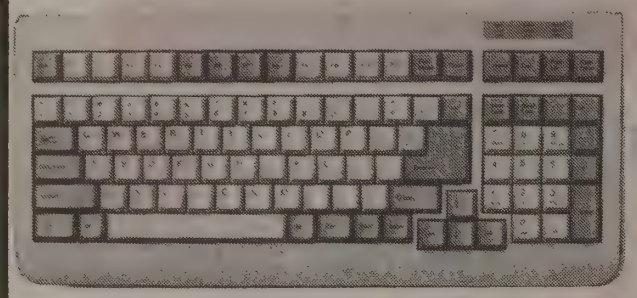

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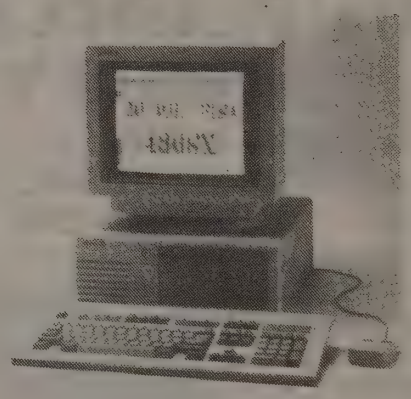
PRODUCT SPOTLIGHT

fault-tolerance. The ALR ADA controller uses a standard interface to support DOS, Novell NetWare, and SCO UNIX operating environments. In addition, it is capable of uprooting any industry standard IDE drive and 8- or 16-bit AT compatible devices. The PowerPro Array systems are delivered with either two or four 210MB IDE drives or 340MB drives. (Suggested list prices for the PowerPro Array systems are from $16,995 to $22,995) Advanced Logic Research, Inc., 9401 Jeronimo, Irvine, CA 92718. (714)581-6670.

TWINHEAD SUPERSET FOR SPEED AND FLEXIBILITY

The Superset 600 line of computer systems provides a compact yet powerful platform that can handle computer tasks with the ease and speed previously only achievable by mini or mainframe systems. Three models are currently available. The Superset 600/25, using a 25MHz 386 processor, is an entry-level system aimed at the small business that needs 32-bit processing on a budget. The Superset 600/25C adds to this a cache board containing 64K of 25ns SRAM. When power is a priority, the Superset 600/425 uses a 25MHz 486 processor. All of the systems include SuperVGA graphics, 32-bit data path, 1.2MB floppy drive, a 101-key AT style keyboard, and MS-DOS 4.01. (List Price for model 600/25 is $2,995, model 600/25C is $3,195, model 600/425 is $7,190) Twinhead Corp., 1537 Centre Pointe Dr., Milpitas, CA 95035. (408)945-0808.



MITAC 486SX

MiTAC's 4270E is a 20MHz 486SX that comes standard with 1MB, a 5.25" floppy drive, and MS-DOS 4.01. There is a socket for an optional Weitek coprocessor. Other features include support for up to 64MB of on-board memory, two serial and one parallel ports, four EISA slots, and a video controller supporting up to 1024 x 768 resolution with sixteen colors. ($2,995) American MiTAC Corp., 410 E. Plumeria Dr., San Jose, CA 95134. (408)432-1160.

PC SOFTWARE

PFS:WINDOW WORKS

PFS:Window Works, from Spinnaker Software, is the first integrated software package for Windows 3.0. It features a word processor with page layout capabilities, spreadsheet, chart editor, database, communications module, address book, and label maker. The program dynamically links the different modules of the package together.

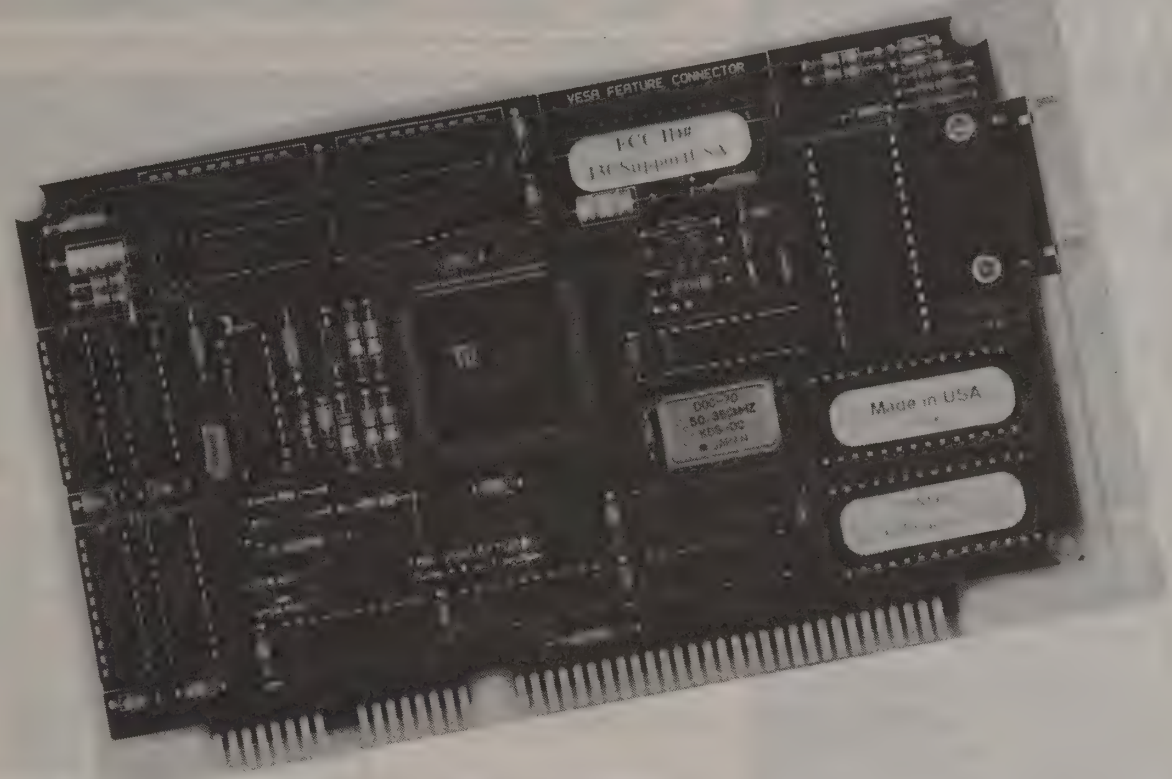
Continued

TCI Master VGA Hi-Color 16-bit Turbo

TCI is setting new standards in the high demand personal graphics computing area with the Hi-color 16-bit Turbo Master 1Mb VGA

Just as the name implies, the Hi-color 16-bit Turbo while mastering 1024 by 768, 800 by 600, and 640x480 resolutions on 256 colors in both interlaced or non-interlaced modes, will be compatible with all VGA, EGA, CGA and MGA standards and extra color of 32,768 colors at up to resolution 800x600.

The low chip count has lead to the increased reliability in this U.S. made product. In addition, TCI Master VGA Hi-color 16-bit Turbo comes with a seven year warranty and 48 hours RMA return policy. And don't forget our superior customer support.



Advanced Features

- Supports up to 1024x768 with up to 256 Colors
- 800x600 and 640x480 with up to 32,768 Colors
- Supports Interlaced or Non-interlaced Monitor
- Compatible with all industry standard video modes (VGA, EGA, CGA, MGA, & Hercules)
- Autosense 8 or 16-bit slots
- 1Mb RAM installed
- 132 column text-display
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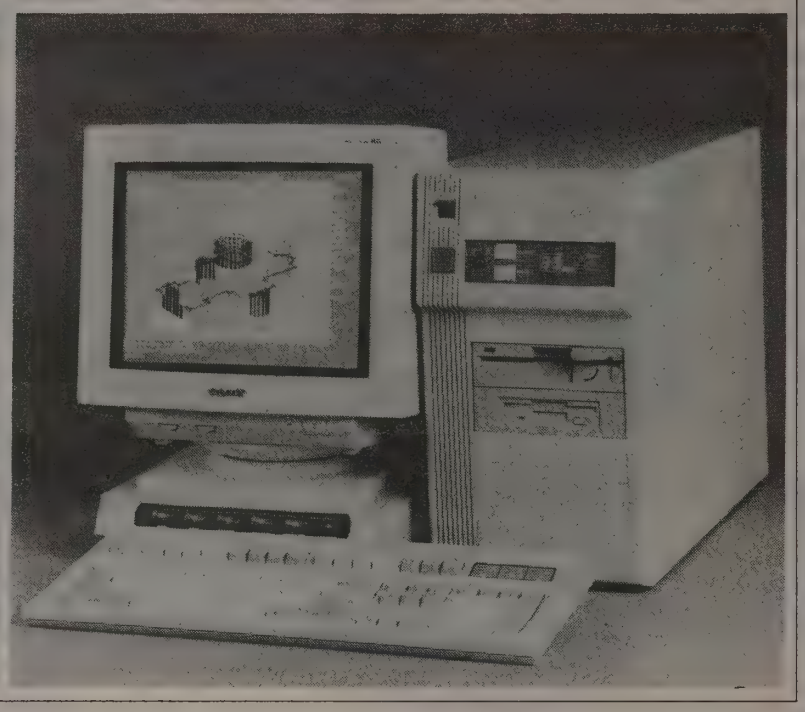

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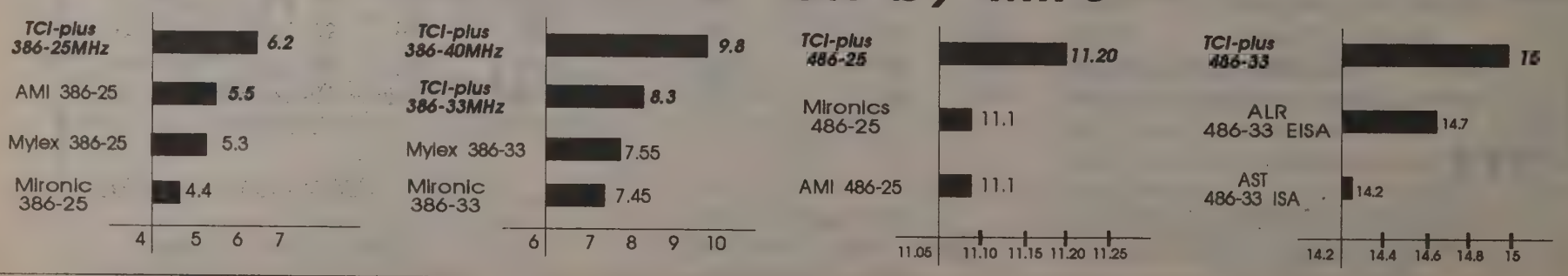

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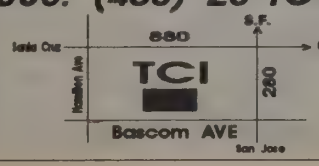

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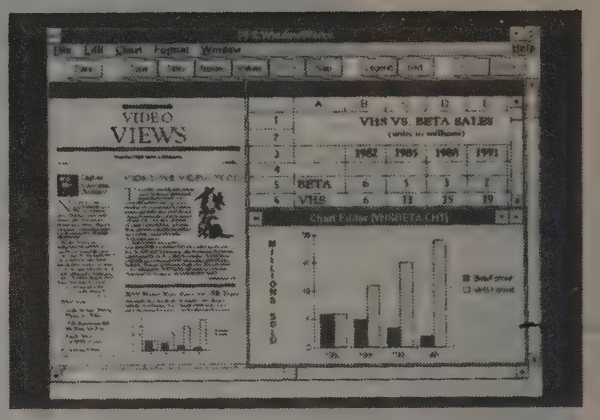

The user can, for example, write a memo in the word processor, build a spreadsheet in the spreadsheet module, and paste a copy of the spreadsheet in the memo. This new document remains "live," so that changes in the spreadsheet are automatically reflected in the memo. Spinnaker recommends a 16MHz 386SX or better. ($199) Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139. (617)494-1200.

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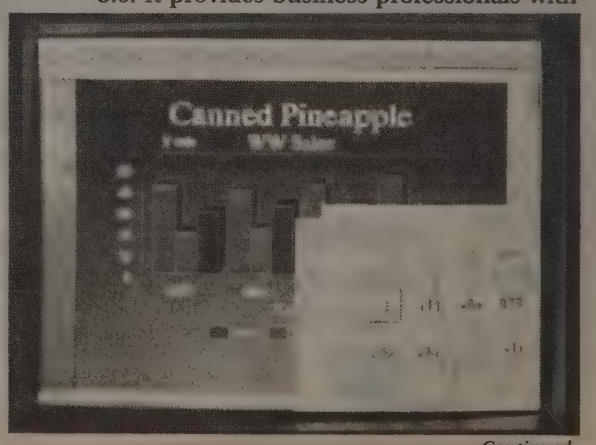

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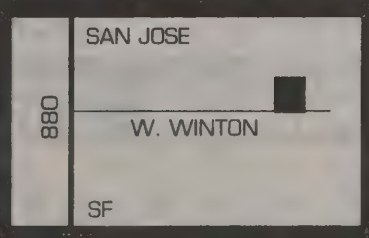

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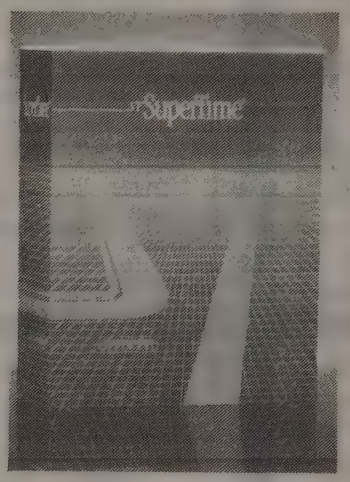
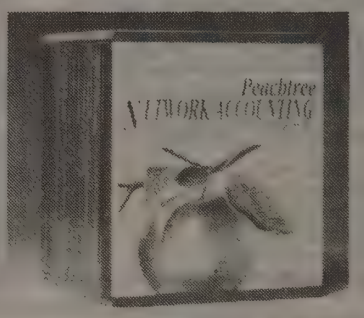


daily activities of an entire LAN-connected office. Super-Time's features include an appointment calendar, project and task management, message center, contact directory, DOS shell/menu, and reference libraries. The project and task management function handles the everyday "to do" lists and is capable of organizing every facet of a large project within an organization. The message center creates phone messages and interoffice memos/email, storing them along with calendar messages, for retrieval by individual users. SuperTime is compatible with any Network OS that complies with DOS 3.X file locking protocol including Novell, Banyan, Hayes, and Artisoft. (Suggested retail price begins at $295 for the single-user/single-resource version, through $8,895 for one hundred resources and $85 for each additional resource) SuperTime, Inc., 2025 Sheppard Ave. E., Suite 2206, Willowdale (Toronto), Ontario, Canada M2J 1V7. (416)499-3288.

PEACHTREE NETWORKS

Peachtree Network Accounting combines Peachtree Complete III accounting software and Peachtree Data Query III custom reporting software into a single networkable package that runs on NetWare, LANtastic and other NETBIOS compatible local area networks. Peachtree Network Accounting in-

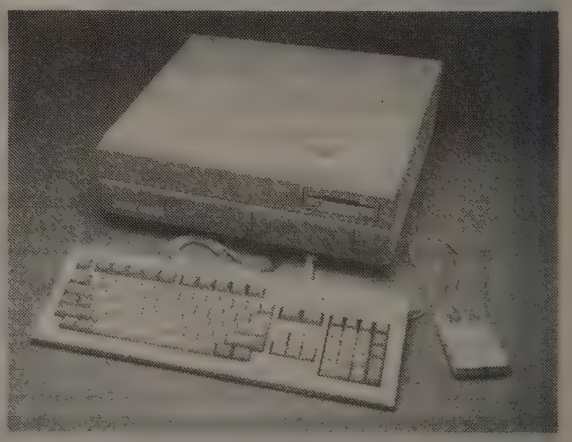


cludes nine comprehensive modules, a pop-up menu system, context-sensitive help, and shortcut keys. Software and peripherals are easily shared by all users on the network, saving both time and money. Also included are multiuser reporting capabilities for examining and interpreting data from the different modules. Peachtree's Data Query lets several people run reports from the same data simultaneously. ($695) Peachtree Software, Inc., 1505 Pavilion Pl., Norcross, GA 30093. (404)564-5700.

AMIGA HARDWARE

AMIGA TARGETS SMALL BUSINESSES

Demonstrating its commitment to providing solutions to meet the needs of small-business users, Commodore has introduced the



Amiga 2000HD Professional. Built around the Amiga 2000HD CPU, it includes 1MB RAM, expandable to 9MB, and a 50MB hard disk preloaded with eight easy-to-use programs: TransWrite, Advantage spreadsheet Goldfile database, MediaShow business presentation graphics, PageSetter II, Print 2000, Music 2000, and CrossDOS to read and write MS-DOS files. The system also includes an instructional video tape and Commodore's powerful AmigaVision authoring program that enables users to create effective presentations. ($1,999) Commo-

Continued on page 164

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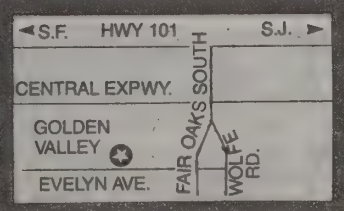

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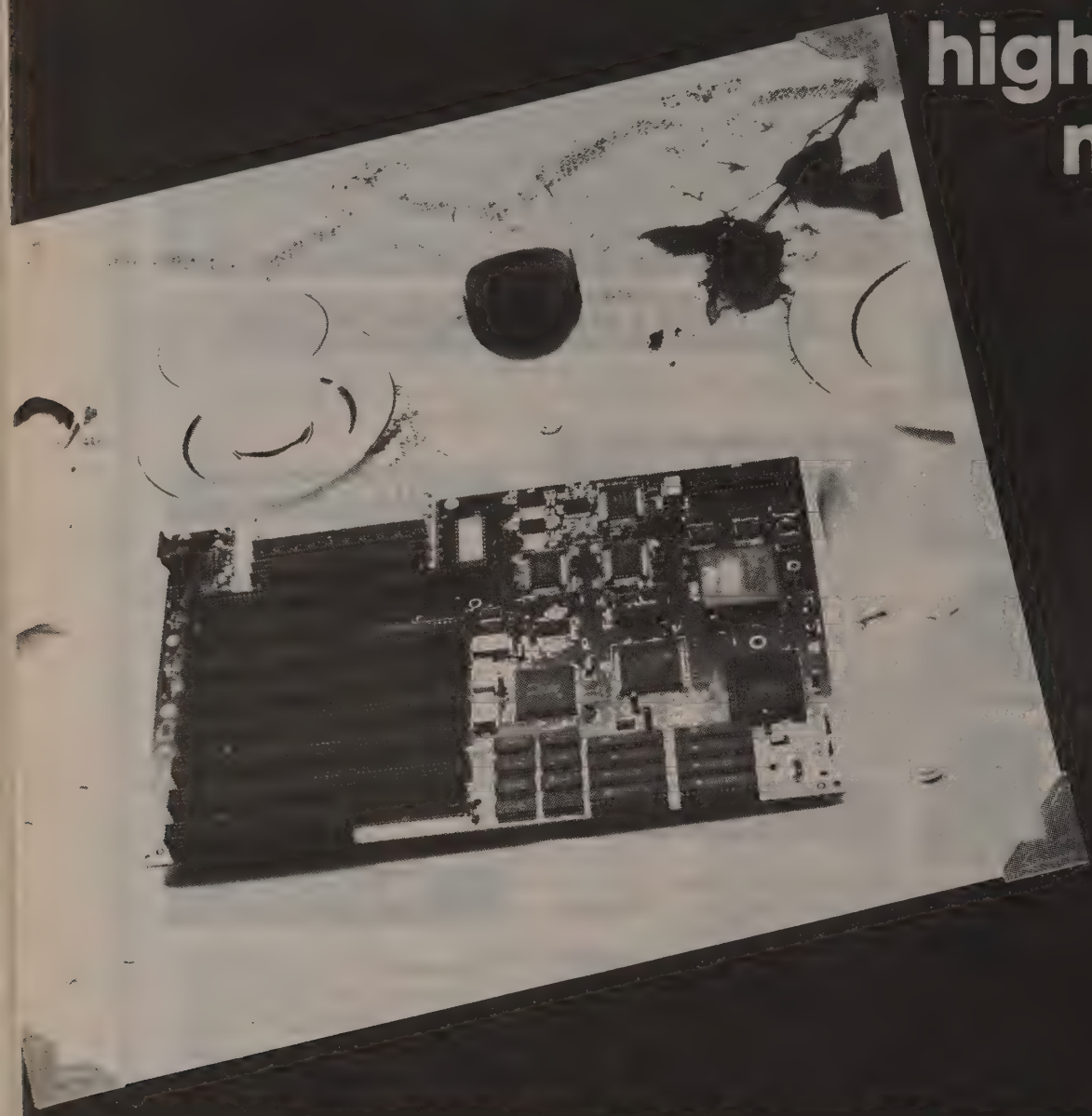

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- Intel 80386DX-25/33 CPU
- Austek A38202 cache controller
- Built-in 64K cache RAM, expandable to 128K
- Supports up to 32M DRAM in SIMM
- Supports shadow RAM
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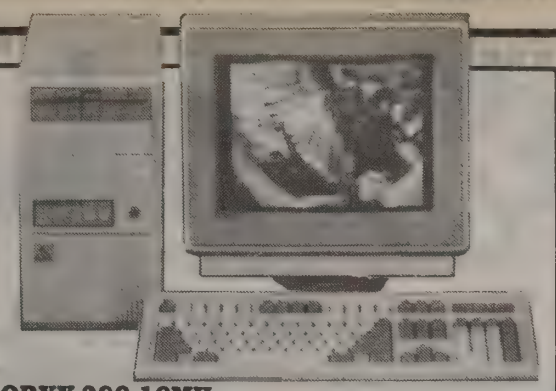

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- 40 MB IDE Hard Drive
- IDE 2 FD/HD Controller
- 2 Serial, 1 Parallel, 1 Game Port
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ORYX 386SX-16MHz
LANDMARK = 21

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- Real Time Clock with Battery Back Up
- TEAC 1.2 or 1.44 MB Floppy Drive
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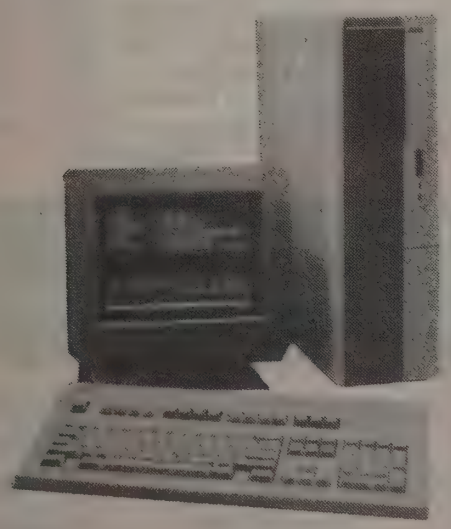

ISA 486-33MHz w/128K Cache
LANDMARK = 150

- 4 MB RAM Expandable to 16 MB
- AMI Bios
- Real Time Clock with Battery Back Up
- TEAC 1.2 or 1.44 MB Floppy Drive
- Conner 200 MB IDE Hard Drive
- IDE 2 FD/HD Controller
- 2 Serial, 1 Parallel, 1 Game Port
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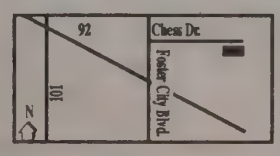

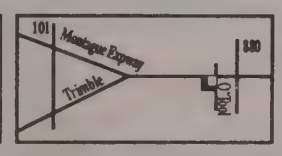

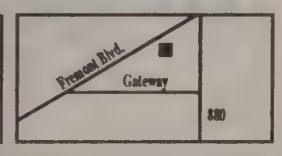

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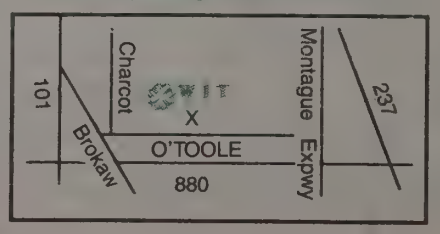

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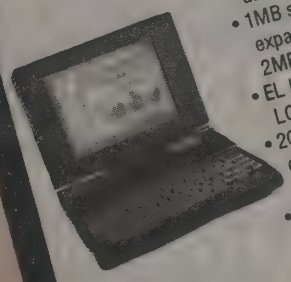

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- 20 MB hard disk drive (23msec average access)
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- 4.4 lbs.
- Supertwist LCD VGA

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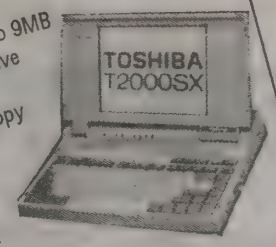

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- 286-12 MHz
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Venture 16

- 386SX-16MHz
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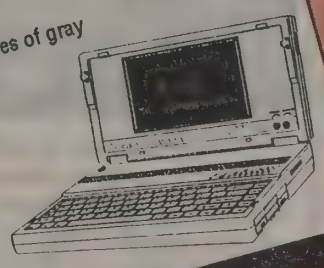

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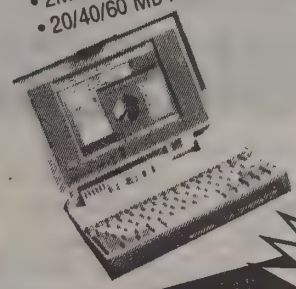
- 386SX/20
- VGA with 32 gray shades
- 2MB RAM
- 20/40/60 MB hard drive



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- 1.44MB floppy drive
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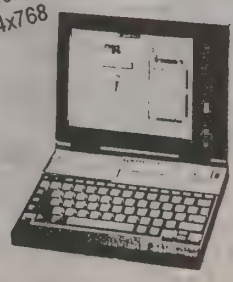

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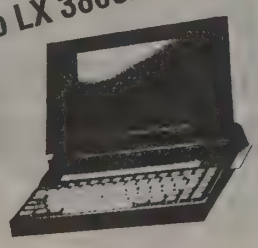

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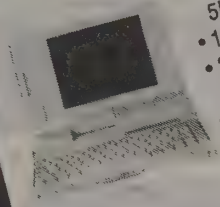

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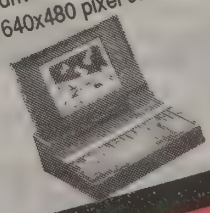

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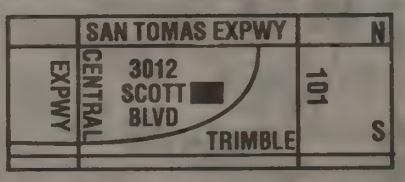

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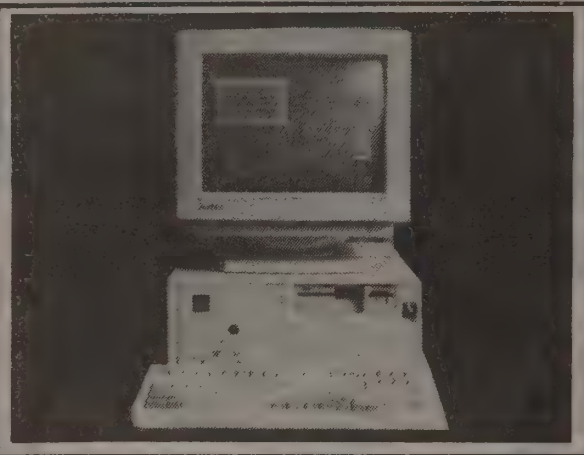

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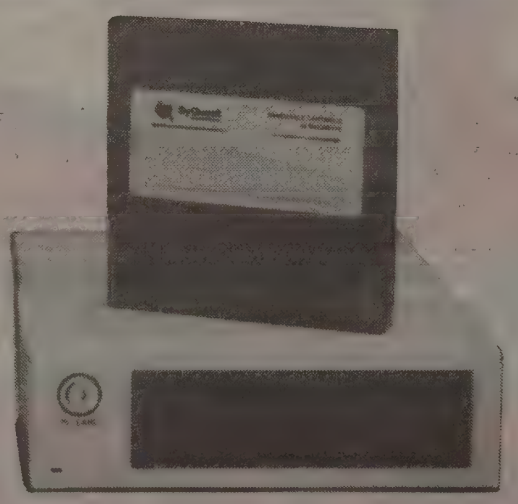

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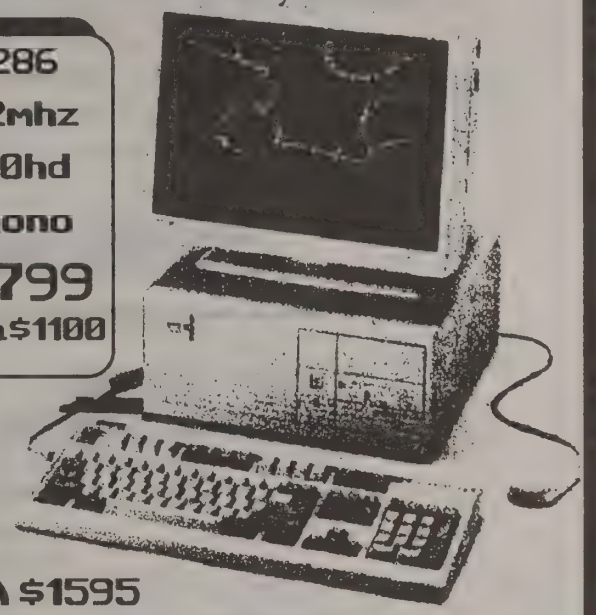

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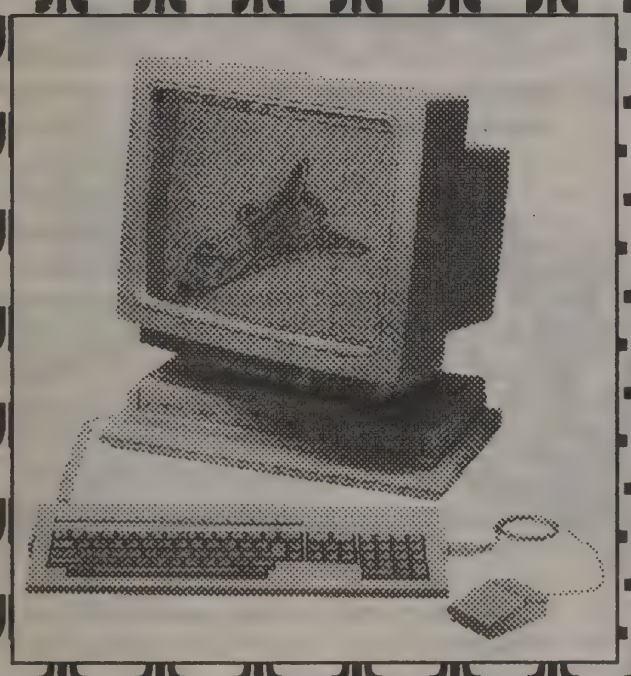

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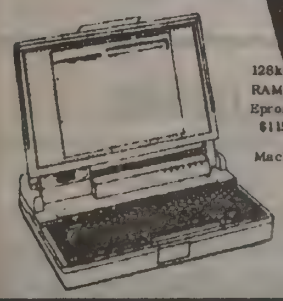

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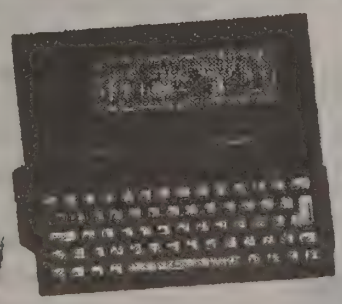

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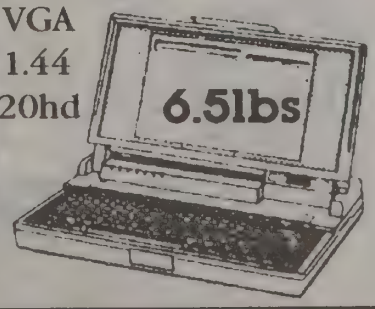


Continued from page 156

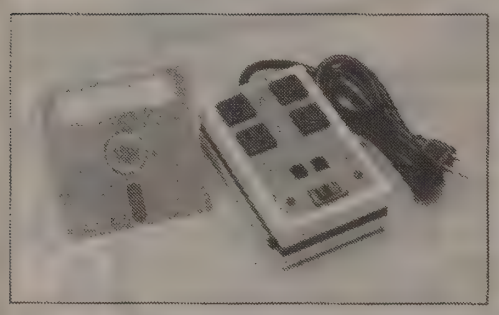
dore Business Machines, Inc., 1200 Wilson Dr., West Chester, PA 19380. (215)431-9100.

LOW-COST SCANNER FOR AMIGA

ASDG and Prime Option have teamed up to provide high-quality color imaging for Commodore Amiga users. The Phovos 300C is a 24-bit plane flatbed scanner that offers 16.7 million colors and resolution up to 600 dpi. Connecting through a high-speed parallel port, the Phovos 300C does not require a special interface board and can be used with any model of the Amiga personal computer that has sufficient memory. The scanner is bundled with ASDG scanner control software catering to both video- and print-oriented users. ($1,995) ASDG, Inc., (608)273-6585. Prime Option, Inc., (213)618-0274.

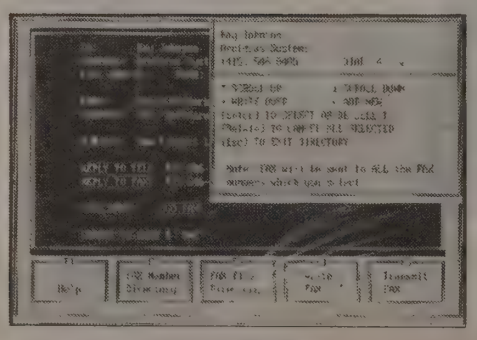
COMMUNICATIONS

POWER CONTROL FOR REMOTE ACCESS



Remote Power-On/Off, the modem activated power control unit that gives PC users power on/off control of remote PCs, has added an Accessory Kit and control software to allow call back security, remote reboot, and software commands to control power. The Power Control Accessory Kit is ideal for users of remote control software packages that permit the remote PC to dial back to the calling PC. The Kit is packaged with a Power Control Program diskette and a special Control Cable that connects the unit to your PC. This package ensures that remote users can take full advantage of the application programs and data stored on central office computers at their convience, after normal working hours or on weekends, without requiring that these central systems run 24 hours a day. ($79.95) Server Technology, Inc., 2332 B Walsh Ave., Santa Clara, CA 95051. 1-800-835-1515.

ON THE GOFAX FOR LAPTOPS



On The GoFAX offers a cost effective way to send a fax directly from any laptop or notebook computer. The program works by tagging or capturing any word processing, spreadsheet, or graphics file on a laptop, requiring only 48K when activated. On The GoFAX allows users to create documents using more than one application. To transmit a fax, you select a name from the speed dial log, On The GoFAX does the rest. The file is sent to an AT&T service bureau where it will wait for an available line to complete the transmission. The program can be used from any telephone. It doesn't matter if you are in a hotel room, at a pay phone, or in a car with a cellular phone. It works on any IBM compatible laptop or notebook computer equipped with a Hayes compatible modem. (69.95) Ibis Software, Inc., 60 New Montgomery, Suite 820, San Francisco, CA 94105. (415)546-1917.

ADVANCED EZ-FAXLAN

Advanced EZ-FaxLAN is a LAN fax card with LAN fax server and workstation software. It features HP LaserJet compatibility for laser quality faxing, fax send/receive capability, and optimized RAM configuration that leaves maximum memory allocation for the network operating system and main application. Advanced EZ-FaxLAN has "tested and approved" certification for both Novell NetWare and Artisoft LANtastic network operating systems. It also operates on 3COM 3+, Microsoft LAN Manager, IBM PC LAN, Banyan VINES, CBIS Network-OS, and other MS-Net-based networks. (List price ranges from $499 for entry level version to $1,799 for the advanced version) Calculus, Inc., 522 Mercury Dr., Sunnyvale, CA 94086-4018. (408)733-7800.

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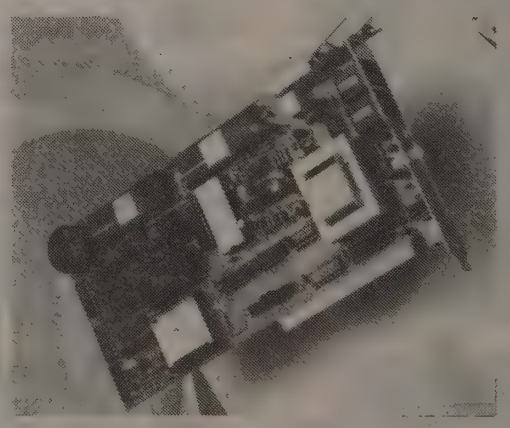
SpeedModem Champ is a new low-cost, high-performance 9600 bps modem that achieves its speed without any data compression. In addition, using CompuCom's own data compression and error checking protocols, the Champ can increase its data speed up to 38,400 bps. This internal card provides downward compatibility to 2400, 1200, or 300 bps and MNP5 modems. The SpeedModem Champ features eight COM port addresses and five interrupts for full flexibility when configuring, and support for Hayes compatible communications software. ($169 with a five-year warranty and thirty-day money back guarantee) CompuCom Corp., 1180-J Miraloma Way., Sunnyvale, CA 94086. 1-800-228-6648.



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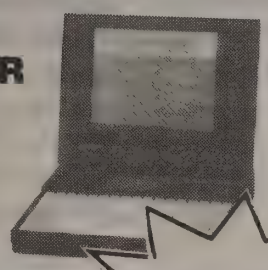

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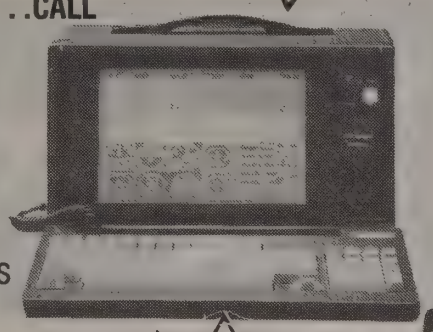

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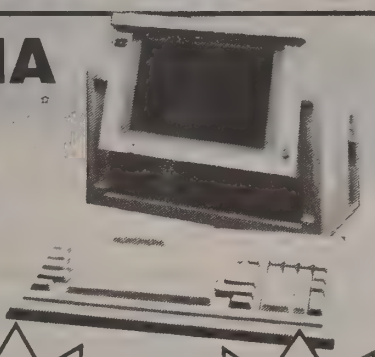

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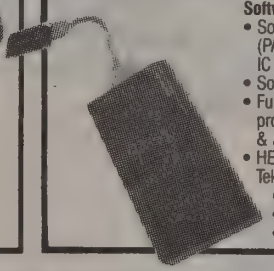

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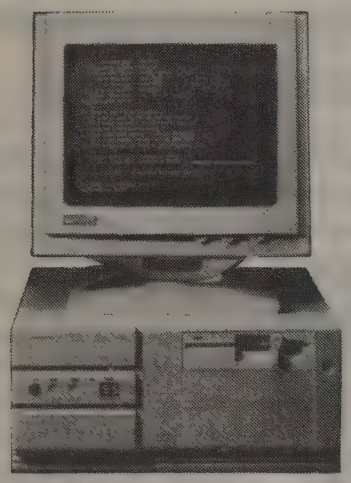

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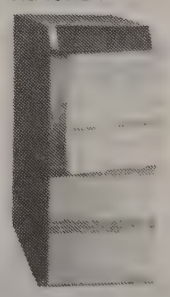

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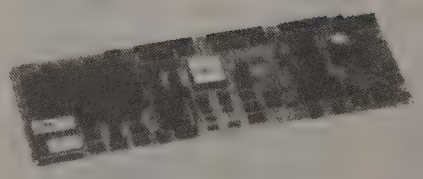
password protection to ensure data security. The FastCache-32 comes standard with the FastCache card, 1MB 80ns cache RAM, four floppy disk cables, one dual drive SCSI cable, and BIOS software with DOS support. New driver software provides support for almost all CD-ROM drivers as well as DDS/DAT tape drives. (List price for the basic unit is $395, CD-ROM and tape drive device drivers are bundled together as an option for $49) Corporate Systems Center, Inc., 730 N. Pastoria Ave., Sunnyvale, CA 94086. (408)737-7312.

VIEWSONIC ENHANCED SUPERVGA

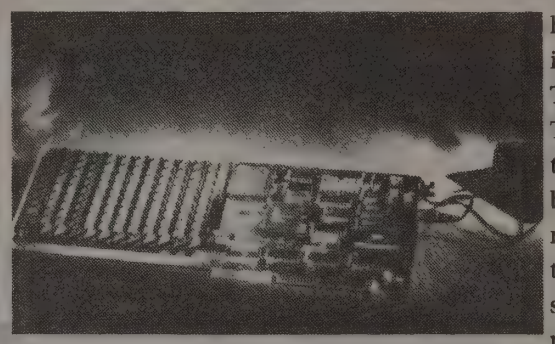
PerfectView+ is a SuperVGA card with 70Hz refresh rate at 1024 x 768 resolution and 1MB of memory for displaying 256 colors. This board is compatible with multi- and single-frequency analog monitors, as well as two fixed frequency monitors for dual applications. PerfectView can be used with all PC compatible and PS/2 computer systems offering professional quality graphics suited for applications from DTP, CAD/CAM, and multimedia. This high-resolution, 16-bit, enhanced video graphics adapter card is designed for full-page documents, large spreadsheets, and intricate drawings. ($299) ViewSonic, Inc., 12130 Mora Dr., Santa Fe Springs, CA 90670. 1-800-888-8583.



SDC SERIES 400 CACHE CONTROLLER

The Series 400 line of caching disk controllers from SDC is compatible with any IBM PC/AT compatible computer. It accelerates disk intensive tasks by up to ten times, improving the overall performance of networking, engineering, publishing, database, image and voice processing, and other applications. The Series 400 controllers feature an easy-to-install single-board design that fits into a standard 16-bit ISA/EISA expansion slot and replaces the conventional hard disk/floppy disk controller. It emulates the industry standard WD-1003 controller interface to ensure compatibility with all standard operating systems. Each Series 400 controller supports two 5.25" or 3.5" floppy disk drives. ($895 for IDE and SCSI models, $895 for ESDI model controllers) Speciality Development Corp., 1001 Capital of Texas Hwy. S., Austin, TX 78716-4017. (512)327-8608.

COMPUTER MODULES TURBODISC

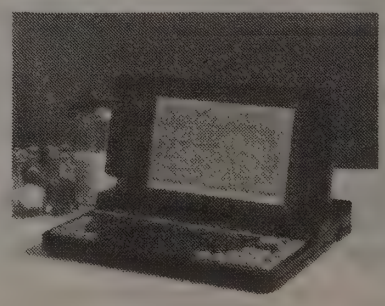


Turbodisc is a 96MB, battery backed, solid state RAM disk that emulates a hard disk in 386-based PCs. It achieves its high speed using a full 16-bit interface to the PC/AT bus. Typical access time is 170ns. Turbodisc includes from 2MB to 48MB of SIMM memory per board. Two boards can be mounted in one system, which the software will access as a single unit, offering a maximum capacity of 96MB of memory. Memory expansion is available in either 2MB or 8MB increments. ($645 per board) Computer Modules, Inc., 2348C Walsh Ave., Santa Clara, CA 95051. (408)496-1881.

LAPTOPS

SPEED & POWER IN THE GRID 286 NOTEBOOK

The GRiD 1720 is a 16MHz 286 notebook computer with VGA display, a 2400 bps modem, 1MB RAM, an internal 20MB hard disk, and an internal 3.5" 1.44MB floppy disk drive. The 9" triple supertwist, black-and-white VGA display supports sixteen scales of gray. Powered by a three-hour internal battery pack, the GRiD 1720 can be easily recharged in two hours. A manually activated standby mode allows the user to interrupt work for extended periods without turning the unit off. Users are able to resume work by hitting any key. Options include a 60MB hard disk drive, expandable memory to 3MB or 5MB, auto adapter, 80C287 coprocessor, and carrying case. ($3,495) GRiD Systems Corp., PO Box 5003, Fremont, CA 94537-6599. (415)656-4700.



AT&T OFFERS A SAFARI

The new Safari NSX/20 20MHz 386SX notebook computer combines ease of use, extended battery life, and integrated communications. The Safari is preloaded with software that includes MS-DOS 4.01, Windows 3.0, an

Continued

486 33MHz SYSTEM

- AMI BIOS
- IDE Controller
- Teac 1.2 MB or 1.44 MB Drive
- 1 MB Expandable to 32 MB Drive
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- **128K Second Level Cache**
- Maxi-Switch 101 Keyboard
- 2 Serial/1 Parallel

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- 1 MB Expandable to 32 MB
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- Maxi-Switch 101 Keyboard
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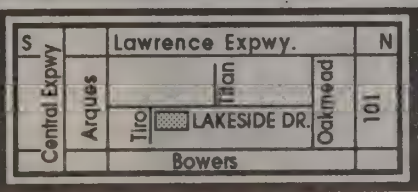

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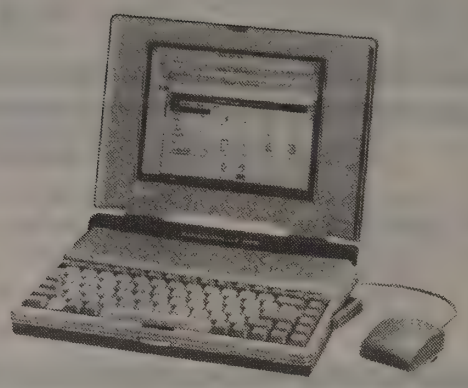
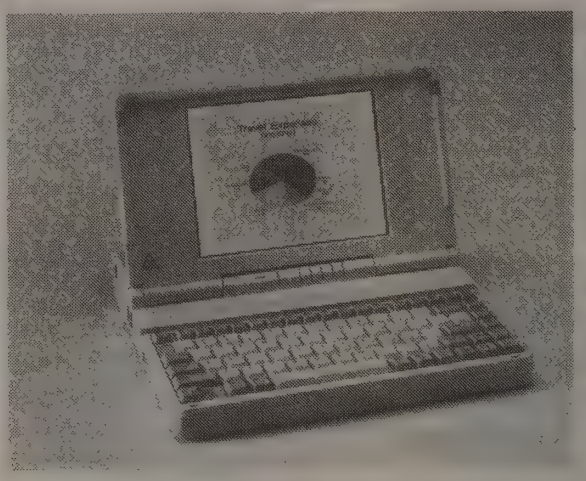


advance release of AT&T Access PLUS for Windows, and a custom tutorial called Safari TourGuide. It comes with a 40MB hard disk drive, 2MB RAM, upgradable to 6MB, a 3.5" floppy drive, a built-in 2400 bps modem, a mouse, AC power adapter, and a charger for the two nickle-cadmium batteries. The two batteries provide up to six hours of non-stop power that can be extended to nine hours by installing a spare without interrupting your work. Email services are provided through AT&T EasyLink Services. ($5,399)

LEADING EDGE 386SX NOTEBOOK

The N3/SX is a fully featured 16MHz 386SX notebook computer featuring a sidelit triple supertwist LCD capable of generating thirty-two shades of gray. The 84-key keyboard with



embedded numeric keypad, twelve function keys, and conveniently positioned "inverted T" cursor keys, has standard key spacing for ease of use. The computer is fully functional when the cover is closed, enabling the user to connect an external keyboard and monitor. Standard features include 1MB RAM, expandable to 5MB, one 1.44MB floppy drive, and a 20MB hard drive. There is one proprietary slot dedicated for an optional 9600 bps send/receive fax or data modem. ($2,595. The N3/SX20, a 20MHz 386SX version is $2,895) Leading Edge Products, Inc., 117 Flanders Rd., Westborough, MS 01581-5020. (508)836-4800.

USM NOTEBOOK

The new 386SX notebook computer from US Mach comes in two configurations of processor speed: a 16MHz 386SX and an optional 20MHz version. Standard features include 2MB RAM, expandable to 4MB, a 3.5" 1.44MB floppy disk dirve, a 20MB hard disk drive, a grayscale backlit LCD display with 640 x 480 resolution, power adaptor, and NiCad battery pack. Users can easily upgrade the power and flexibility of the notebook with an optional 2400 baud internal modem, with or without fax capabilities, an extended keyboard, external numeric keypad, and an Intel 387SX coprocessor. (List price begins at $1,995) US Mach, Inc., 43104 Christy St., Fremont, CA 94538. (415)623-9040.

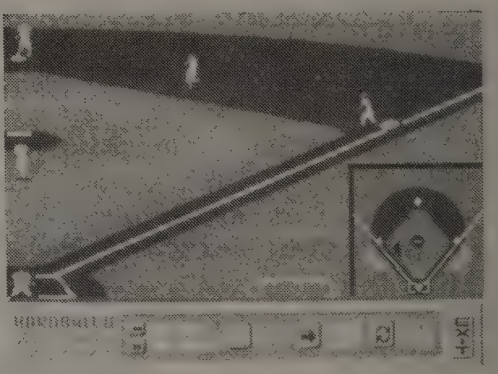
GAME REVIEWS

By Mike Markowitz

HARDBALL II

Designed By: Don Mattrick, Chris Taylor and Rick Friesen
Published By: Accolade
For: Macintosh (including Classic, LC, and IIsi)
List Price: $54.95

Originally released in 1985, this intensive baseball simulation has been reborn in a spiffy new sixteen-color Mac version, with



You can tweak sixteen different variables to adjust the complexity of the game. A powerful Team Editor lets you assemble any historical or imaginary team.

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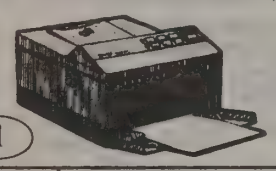

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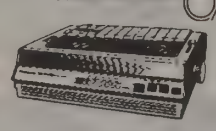

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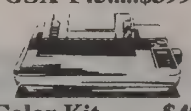

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*101-key AT keyboard
*1 year P&L warranty
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*1MB RAM (80ns)
*Upgradeable to 8MB
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*Teac 1.2MB FDD
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*2S\1P\1G ports
*101-key AT keyboard
*1 year P&L warranty
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*Intel 80386-25 CPU
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*2S\1P\1G ports
*101-key AT keyboard
*1 year P&L warranty
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*2S\1P\1G ports
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*AMI BIOS
*Teac 1.2MB FDD
*1:1 IDE FD/HD CTL
*2S\1P\1G ports
*101-key AT keyboard
*1 year P&L warranty
$1699 Made in U.S.A.

***** Free Serial Mouse For Any Complete System Purchased.*****

Monitors

NEC 4D	$999	Hyundai 12" Amber $79
NEC 5D	$2099	Hyundai 14" Amber $109
SONY 1304	$649	SEIKO 1440 $499
SONY 1320	$459	SEIKO 1450 $599
NEC 2A	$449	Amazing SVGA $379
NEC 3D	$589	ViewSonicSVGA $349
NEC 3DS	$599	Goldstar VGA $230
		Panasonic 1381 $379
		Acer 14" Paper White $109
		Nanao 9070u $999
		Nanao 9080i $1249
		Nanao 9500 $2299

Video Adapters

ATI 8514/Ultra 70Hz VGA	$399	OAK 800X600 VGA 256K $59
ATI 512K VGA w/mouse	$199	Trident 1024 VGA 512K/1MB $99/129
ATI 512K VGA	$159	Paradise 1024 OEM 256K/512K $89/119
Genoa 6400A 70Hz VGA	$229	Video 7 1024i 512K/1MB $229/269
Tseng Labs 1024 1MB	$149	Video 7 VRAM II 512K/1MB $379/499
		Orchid ProDesigner 256K/512K $149/169
		Orchid ProDesigner II 512K/1MB $229/259

Hard Drives

Western Digital 40MB	$209	Maxtor 80MB IDE	$399
Seagate 40MB IDE	$199	Maxtor 200MB IDE	$699
Seagate 40MB MFM	$239	Maxtor 158MB ESDI	$839
Conner 100MB 25ms	$439	Maxtor 338MB ESDI	$1199
Conner 200MB 16ms	$699	Maxtor 676MB ESDI	$1829
Toshiba 157MB ESDI	$649	Seagate 125MB IDE	$479
		Seagate 332MB SCSI	$1199

Modems

Aceex 2400 Int/Ext	$59/99
Everex 2400 Int/Ext	$79/179
Everex 24/96 Fax/Modem	$279
Intel 2400 Int/Ext	$159/199
Intel Satisfaxtion 24/96	$419
Hayes 2400 Int/Ext	$299/360

Scanners

HP ScanJet+ w/IF	$1449
Canon IX-12F w/IF	$595
Canon IX-30F w/IF	$1599
Scan Plus w/IF&PP	$599
Logitech Scanman+	$159
Logitech Scanman256	$295

Misc

Read Right OCR	$329
Wiz Digitizer	$149
Sound Blaster	$149
Logitech wireless mice	$135
Laptop Ext FDD	$Call
Memory	$Call

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Lawrence Livermore Laboratories
DuPont Southwestern Bell
and the list goes on and on...

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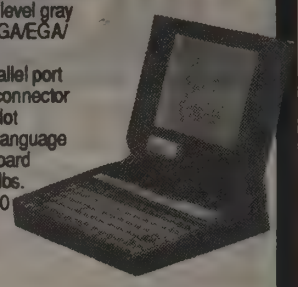
MICRO-L® Laptop $1779

- 80386SX-16 Intel microprocessor • AMI BIOS
- 2MB SIMM expandable to 6MB
- One 3.5" FDD & one 40MB HDD
- LCD display w/16 level gray scales mono w/VGA/EGA/CGA support
- 1 Serial and 1 parallel port
- Ext. video (VGA) connector
- Internal modem slot
- 85/86 keys, multi-language ALPS tactile keyboard
- Weighs only 10.9 lbs.
- Travel bag add $50
- Extra battery pack add $69



MICRO-L® 486-25/33 EISA Cache $2,645

- Intel 80486-25MHz CPU, Lndmk: 111.80 MHz
- CMOS Set-up, MIPS: 10.979
- 256KB Cache memory
- 4MB RAM expandable to 64MB on-board
- Supports external Weitek 4167
- Eight expansion slots (Six 32-bit, two 16-Bit ISA)
- AMI/Award 486 BIOS supports shadow RAM
- 1.2MB and 1.44MB Foppy drives (TEAC)
- 2 serial/1 game/1 parallel ports
- IDE Hard/Floppy Disk Controller
- Keytronics 101 keyboard (USA)
- Tower case w/230W Power Supply/7 bay drive/digital display w/230W power supply
- **33MHz (Lndmk : 146.50, MIPS: 14.489) add $175**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440	14" Multiscan 1024 x 768 Sony 1304**
Basic System	2,645	3,085	3,360	3,495
WITH HARD DRIVE				
80MB - IDE, 19ms	3,010	3,450	3,725	3,860
120MB - IDE, 19ms	3,070	3,510	3,785	3,920
210MB, 16ms - IDE	3,370	3,810	4,085	4,220
338MB, 16ms - ESDI*	3,940	4,380	4,655	4,780

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIs - 1MB

PC NOTEBOOK

Architecture IIBM PC/AT compatible (AMI BIOS)

CPU 80386SX 16MHz
Runs at 8/16MHz software selectable

Co-Processor 80387SX (End-user installed option)

Core Logic Toshiba

DRAM Memory Basic 2.0MB, expandable to 4.0MB
EMS support (LIM 4.0)

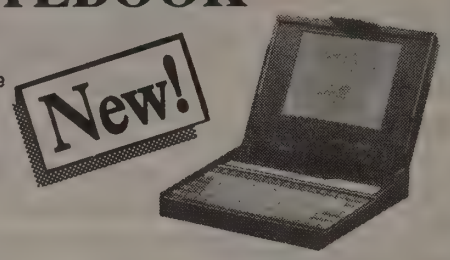
I/O Interface RS-232C x 1 (Async, 9-pin)
External 5.25" FDD/Printer port
VGA Output (15-pin)
PS/2 compatible port
External 101/102 keyboard adaptor for mouse port
External expansion box port

I/O Slot Expansion memory slot x 2MB
(End-user selectable option)

Disk Drive 3.5" FDD x 1 (1.44MB)
2.5" HDD x 1 (20MB)
Optional - (40MB add $175)

Power Supply Cartridge type Ni-Cad battery with external AC Adaptor/Recharger

Screen VGA compatible screen (640 x 480 dots)
Black & White LCD with Backlit (CCFT)
16/32 Gray Scales



Keyboard Super Low-Profile 80/81 Keys
(101/102 keys emulation)

Modem Slot Internal modem/FAX slot
(End-user installation option)

Dimensions 11.0" x 8.5" x 1.98" (W x D x H)
Weight 6.3 Lbs.Includes HDD, FDD & Battery

MAIN MATERIAL VENDOR LIST

JAPANESE	
LCD: EPSON	Motherboard: TOSHIBA
FDD: MATSUSHIT	Battery: SANYO
Keyboard: ALPS	Inverter: EPSON
	HDD: CONNER (USA)

Only $2,095
80386SX 20MHz - Call!

MICRO-L® 486-25/33 AT/ISA Cache $1,895

- Intel 80486-25MHz CPU, Lndmk: 114.10 MHz
- CMOS Set-up, MIPS: 11.104
- 256KB Cache memory
- 4MB RAM expandable to 16MB on-board
- Supports external Weitek 4167
- Eight 16-bit slots
- AMI/Award 486 BIOS supports Shadow RAM
- 1.2MB and 1.44MB Floppy drives (TEAC)
- 2 serial/1 game/1 parallel ports
- IDE Hard/Floppy Disk Controller
- Keytronics 101 keyboard (USA)
- Tower case w//7 bay drive/digital display/230W P/S
- **33MHz (Lndmk: 149.60, MIPS: 14.597) add $175**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440	14" Multiscan 1024 x 768** Sony 1304
Basic System	1,895	2,335	2,610	2,745
WITH HARD DRIVE				
80MB - IDE, 19ms	2,260	2,700	2,975	3,110
120MB - IDE, 19ms	2,320	2,760	3,035	3,170
210MB, 16ms - IDE	2,620	3,060	3,335	3,470
*338MB, 16ms - ESDI	3,190	3,630	3,905	4,035

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIs - 1MB

MICRO-L® 386-33/Cache $1,295

- Intel 80386-33MHz CPU, Lndmk: 58.7MHz/, MIPS: 7.89
- 4MB RAM exp. to 64MB on-board • TI™ Chipset
- AMI BIOS • 80387 Weitek 3167 co-processor socket
- 64k Exp. to128k cache on-board, w/cache controller
- True OS/2, XENIX, MS DOS, & Novell compatible
- 8 expansion slots (8-16 bit)
- IDE Hard/Floppy Disk Controller • 2 Serial/1 Par. ports
- 1.2 MB and 1.44MB FDs (Teac)
- Keytronics 101 keyboard (USA)
- Tower case w/7 bays/digital display w/230W P/S
- MS DOS 3.3 or 4.01 included
- **Optional-Mobo w/SIS™ Chipset, upto 16MB-Less $70**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440	HiRes VGA** 1024 x 768 Sony 1304
Basic System -	1,295	1,735	2,010	2,145
WITH HARD DRIVE				
80MB - IDE, 19ms	1,660	2,100	2,375	2,510
120MB - IDE, 19ms	1,720	2,160	2,435	2,570
210MB - IDE, 16ms	2,020	2,460	2,795	2,870
338MB, 16ms - ESDI*	2,590	3,030	3,305	3,440

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIs - 1MB

MICRO-L® 386-25 $695

- 80386-25MHz CPU, Lndmk: 30.0MHz
- True OS/2, XENIX, MS DOS, & Novell compatible
- 1MB RAM expandable to 8MB
- 80387 co-processor socket
- 1.2 MB or 1.44MB FDs (Teac)
- 1:1 interleave controller or IDE
- AMI BIOS, NEAT™ Chipset
- 8 expansion slots/2 serial/1 game/1 parallel ports
- Keytronics 101keyboard (USA) or Mytek (click-type)
- 6-drive Baby AT case w/ UL 200W power supply
- Optional Tower case w / 7 bays/digital display w / 230W Power Supp;y - add $90

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	14"VGA 640 x 480 Relisys	14" SVGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	695	1,050	1,135	1,410
WITH HARD DRIVE				
40MB - IDE	920	1,275	1,360	1,635
80MB - IDE, 19ms	1,060	1,415	1,500	1,775
120MB - IDE, 19ms	1,120	1,475	1,560	1,835
210MB - IDE, 16ms	1,420	1,775	1,860	2,135

MICRO-L® 386-SX $550

- 80386/SX-16 CPU runs 16MHz
- 80387 co-processor socket
- 1MB RAM expandable to 8MB
- 1.2 MB or 1.44 MB floppy drive (Teac)
- True OS/2, XENIX, MS DOS, and Novell compatible
- AMI BIOS, NEAT™ or VIA™ Chipset
- 1:1 interleave HD/FD IDE controller
- 8 expansion slots/2 serial/1 game/ 1 parallel ports
- Keytronics (USA) or Mytek (click-type)101 keyboard
- 6-drive Deluxe baby-AT case w/ 200W UL power supply
- **386SX-20MHz add $50**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	12" Mono 720 x 350	14" VGA 640 x 480 Relisys	14" SVGA 1024 x 768 0.28 dp
Basic System -	550	650	905	990
WITH HARD DRIVE				
40MB - IDE	775	875	1,130	1,215
80MB - IDE, 19ms	915	1,015	1,270	1,355
120MB - IDE, 19ms	975	1,075	1,330	1,415
210MB - IDE, 16ms	1,275	1,375	1,630	1,715

MICRO-L® 286-12 $365

- 80286-12.5MHz CPU
- True OS/2, XENIX, MS DOS, and Novell compatible
- 80287 co-processor socket
- 1MB RAM expandable to 4MB
- 1.2 MB floppy drive (Teac)
- 2 HD/2 FD IDE controller
- 2 serial/1 game/1 parallel ports
- 101 Enhanced keyboard
- 6-drive Baby AT case w/ UL 200W power supply
- **16MHz add $40**
- **20MHz add $60**
- **25MHz add $80**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	12" Flat Mono 720 x 350	14" VGA 640 x 480 Relysis	14" VGA 1024 x 768 0.28 dp
Basic System -	365	465	720	805
WITH HARD DRIVE				
40MB - IDE	590	695	945	1,030
80MB - IDE, 19ms	730	830	1,085	1,170
120MB - IDE, 19ms	790	890	1,145	1,230
210MB - IDE, 16ms	1,090	1,190	1,445	1,530

MOTHERBOARDS

- 486-33 EISA w/64K Cache/up to 64MB....$2,230
- 486-25 EISA w/64K Cache/up to 64MB....$1,995
- 486-33 AT w/64K Cache/up to 16MB $1,375
- 486-25 AT w/64K Cache/up to 16MB $1,140
- 386-33 EISA w/64K Cache/up to 16MB....$1,195
- 386-33 w/64K CACHE w/CPU- TI upto 64MB....$645
- 386-33 w/64K CACHE w/CPU- SIS upto 16MB...$565
- 386-25 w/CPU - ECS.....$450
- 386-SX/20 NEAT - ECS $365
- 386-SX/20 VIA $365
- 386-SX/16 NEAT - ECS.....$305
- 386-SX/16 VIA $305
- 386-25 w/CPU - SOLUTION.....$190
- 386-20 w/CPU - SOLUTION.....$165
- 286-16 Solution/ VLSI.....$145
- 286-12 VLSI.....$119

HARD DRIVES

- Maxtor XT-7080A 81MB IDE.....$365
- Maxtor LXT-213A 213MB IDE.....$685
- Maxtor XT-4170E/S 158MB $765
- Maxtor XT-4380E/S 338MB $1120
- Maxtor XT-8380E/S 360MB $1175
- Maxtor XT-8760E 768MB $1640
- Maxtor XT-8760S 768MB $1660
- Conner CP-3044 40MB $225
- Conner CP-30104 120MB.....$425
- Conner CP-3204 200MB.....$660
- Quantum LPS52A 52MB 17ms 1".....$250
- Quantum ProDr40A 40MB 19ms $225
- Quantum ProDr80A 84MB,19ms,3.5" $365
- Quantum ProDr105AT 105MB,17ms,3.5" $395
- Quantum ProDr210A/S 210MB,14ms $725
- Western Digital 93044 40MB IDE $190
- Ultrastor 12F ESDI Controller w/52K Cache .$160
- Adaptec 1542B-Kit SCSI Controller FD/HD .$275

MONITORS

- Relisys VGA RE-8513 640 x 480.....$290
- Relisys VGA RE-8514 1024 X 768 0.28dp $315
- Relisys Super Multiscan RE-1520.....$435
- Relisys VGA Gry-Scl RE-8503.....$129
- Seiko VGA 1024X768 CM-1440.....$495
- Seiko VGA 1024x768 CM-1450.....$595
- Seiko 20" VGA 1280 x 1024 CM-2050 .... $1795
- Sony VGA 1024x768 1304.....$620
- NEC 3-D Multi-Sync 1024 X 768.....$625
- Nanao 16" VGA 1024x768 9070-U.....$995
- Nanao 16" VGA 1024x768 9080-I.....$1245
- Sigma Design LaserView 19".....$1595
- Genoa VGA Card 6400 (512K).....$125
- Genoa VGA Card 6400-A (512K).....$195
- SpeedStar Plus VGA 1MB.....$215
- Orchid ProDesigner IIs 1MB.....$235

PRINTERS

- Panasonic KXP-1180 9-pin.....$149
- Panasonic KXP-1123 24-pin, 240cps $239
- Panasonic KXP-1624 24-pin.....$362
- Citizen GSX-140 24-pin.....$279
- Citizen GSX-145 24-pin wide.....$395

LASERJET MEM UPGRADES

- JetRam II, IID, IIP, III -1/2/4MB.....$95/130/210

MISCELLANEOUS

- TEAC 1.2/1.44 MB FD.....$65
- Logitech C-9 Serial/Bus mouse.....$65/77
- FAX modem 2400Baud.....$59
- FAX modem 9600Baud-Recv & software....$165
- U.S Robotics modem 9600BD Infotxt ..$585/605
- Colorado DJ-10 Jumbo Tape Back-up 120MB ..$245
- Colorado DJ-20 Jumbo Tape Back-up 250MB ..$330
- MS DOS 3.3/4.01.....$65
- MS Windows 3.0, w/DOS.....$115
- Keytronics 101 keyboard.....$45
- Focus 2001 Keyboard.....$45

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10 MHz Turbo 8088
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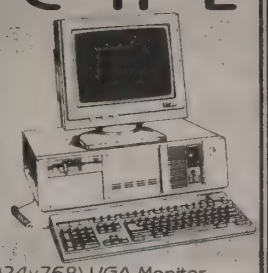
386-33MHz
W/64 CACHE

- 0 Wait State on Motherboard
- Main Memory 1 MB
- Expandable to 2 MB/4 MB/8 MB
- Support Coprocessor Intel or Weitek
- AMI BIOS set up
- 2/Serial 1/Parallel 1/Game Port
- 101 Extended Keyboard
- 1.2 MB TEAC Floppy Drive
- HD Controller with 28MS 40 MB Hard Drive

$1150



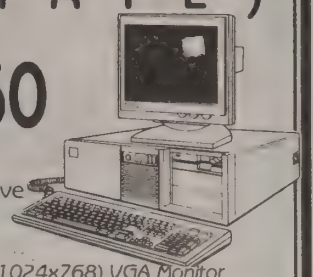
Monitor Options

Mono Monitor with Card $95
VGA Monitor with 16 bit Card 320
Super VGA (1024x768) VGA Monitor with 16 bit Card 390

386-25MHz
(0 WAIT STATE)

- Main Memory 1 MB
- Expandable to 2 MB/4 MB/8 MB
- Support Coprocessor Intel or Weitek
- 2/Serial 1/Parallel 1/Game Port
- 101 Extended Keyboard
- 1.2 MB TEAC Floppy Drive
- 1:1 Interleave Controller with 28MS 40 MB Hard Drive

$1050



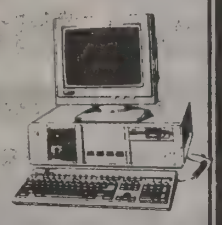
Monitor Options

Mono Monitor with Card $95
VGA Monitor with 16 bit Card 320
Super VGA (1024x768) VGA Monitor with 16 bit Card 390

386-16SX
(0 WAIT STATE)

- Main Memory 1 MB (EMS On Board)
- 8 Slots and Socket for Intel 80387 SX
- 200 W Approved Power Supply
- Real Time Clock with Battery Backup
- 2/Serial 1/Parallel 1/Game Port
- 101 Extended Keyboard
- 1.2 MB TEAC Floppy Drive
- 1:1 Interleave Hard Drive Controller with 40 MB Hard Drive

$795



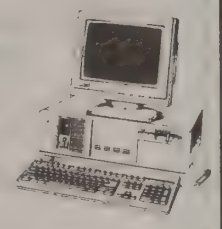
Monitor Options

Mono Monitor with Card $95
VGA Monitor with 16 bit Card 320
Super VGA (1024x768) VGA Monitor with 16 bit Card 390

286-12MHz
(0 WAIT STATE)

- Main Memory 1 MB (EMS On Board)
- 8 Slots, and Socket for Intel 80387
- Foot Print LED AT Case
- Real Time Clock with Battery Backup
- 2/Serial 1/Parallel 1/Game Port
- 101 Extended Keyboard
- 1.2 MB TEAC Floppy Drive
- 1:1 Interleave Hard Drive Controller with 40 MB Hard Drive

$590



Monitor Options

Mono Monitor with Card $95
VGA Monitor with 16 bit Card 320
Super VGA (1024x768) VGA Monitor with 16 bit Card 390

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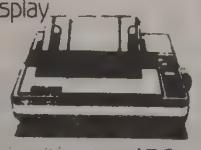
- 9 Pin for true letter quality
- 192 cps
- Color Upgradable
- 2 Year Warranty

$199

Color Option $59

CITIZEN™ GSX-140

- 24 Pin for True Letter Quality
- 192 cps; 64 cps LQ
- LCD Front Panel Display
- 2 Year Warranty



$299

Color Option $59

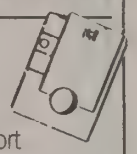
CITIZEN GSX-145

- 24 Pin for true letter quality
- 192 cps
- 132 Column Printer
- 2 Year Warranty

$429

Color Option $59

TRACKMAN
LOGITECH



- 300 dpi resolution
- Requires little desk space
- Thumb ball for extra comfort
- Small ball for extra precision

Serial mouse C9 320 dpi $75
Bus mouse C9 320 dpi $85
Serial TRACKMAN 320 dpi $85.95
Bus TRACKMAN 320 dpi $85.95
SCANMAN PLUS $179
Catchword $125

RODIME HARD DISKS

RO3128A 100 MB 19ms IDE $469

ADD ON BOARD

AT I/O Card 2S/1P/1G $25
Mono Graphic/Printer 25
Color Graphic/Printer 35
XT High Density Floppy Cont 35
XT Hard Disk Cont 49
EGA Card 79
MFM 1:1 HD/FD Cont 69
IDE Dual HD/FD Cont 35
SCSI 1:1 HD/FD Cont 275
RLL 1:1 HD/FD Cont 98
Orchid Pro Designer w/1 MB 269
1024x768 Fastest VGA Card

INTEL MATH CO-PROCESSORS

80287-10 For 286 System $225
387 SX-16 315
387 DX-20 350
387 DX-25 440
387 DX-33 540

FLOPPY DRIVES

360K/1.2 MB Floppy Drive 5¼" $60/70
720K/1.44 MB Floppy Drive 3½" 60/70

MAXTOR HARD DISKS

MT-7080A 80 MB 18ms IDE $429
XT-1085 71 MB 28ms MFM 549
XT-4170 158 MB 14ms SCSI/ESDI 895/850
XT-4380 338 MB 16ms SCSI/ESDI 1295/1295
XT-8760 768 MB 16ms SCSI/ESDI 1850/1850

QUANTUM HARD DISKS

PRO80 AT 80 MB 19ms IDE $469

NEC HARD DISKS

NEC D-3142 65 MB 23ms 3½ RLL $299
NEC D-3661 110 MB 18ms 3½ ESDI 589
NEC D-5655 150 MB 18ms 5¼ ESDI 679

SEAGATE HARD DISKS

ST-225 20 MB $189
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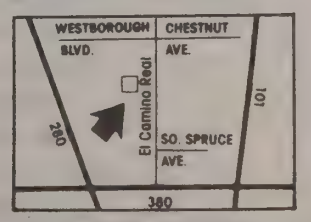

(Inside Fairway Plaza)

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lots of new features.

Hardball is a one or two player game in which players assume the role of team manager. You have control over batting order, lineage, and substitutions. Accurately simulated playing fields include Boston, Kansas City, Chicago, New York, San Francisco, and Toronto. You can view the full field, or take position behind the mound, behind the batter, or in the left or right infield.

You can tweak sixteen different variables to adjust the complexity of the game, and immerse yourself in the statistics of twenty-one different players, plus twenty-two pitcher-specific statistics. A powerful Team Editor lets you assemble any historical or imaginary team.

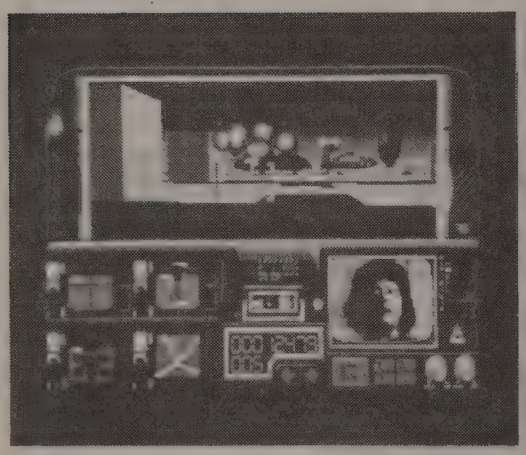
The application is only 187K, but the recommended MultiFinder memory allocation is 1400K. I was surprised by the great number of small files on the two program disks, including bits of animation, sounds, and team parameters—when everything is installed, you have 141 files. This is very bad for a Macintosh program; even on a IIci it takes a long time to open or close the folder that contains Hardball II.

Hardball II uses a cardboard code-wheel, which has become the standard Accolade copy-protection system.

HOVERFORCE

Designed By: Paul Carruthers and Ian Downend
Published By: Accolade
For: IBM PC and compatibles (EGA with 512K or VGA with 640K, hard disk and mouse recommended)
List Price: $49.95

Until quite recently, no general purpose desktop computer (except, perhaps the Commodore Amiga) could compete with specialized video game or arcade machines in delivering high-speed, high-quality animation. Arcade machines have video graphics chips designed to manage moving objects (called "blitters" or "sprites").



As PC's have gotten faster, and PC game programmers have gotten better, this gap has started to close, and HoverForce is a good example.

You pilot an urban assault hovercraft through the quadrants of a futuristic city, dishing out death and destruction to droves of drug dealers and their demented devices. You can steer with the cursor arrows, a joystick, or a mouse. F1 selects the machine gun, F2 selects the cannon, F3 selects missiles, and the Return key fires. Simple controls are good because things happen very, very fast in HoverForce.

The 3D vector graphics and sound effects are excellent, and everything fits on two 360K disks (an installer will copy onto your hard disk only those files needed for your graphic adapter.) Amazingly, the core program (the "executable") is less than 40K; everything else is graphics and sound.

THE SERIOUS BLACKJACK TUTOR, V1.3

Designed By: William E. Blachly
For: IBM PC and compatibles (any monitor, 128K, DOS 2.0 or higher)
List Price: $27.95 + $3 shipping and handling

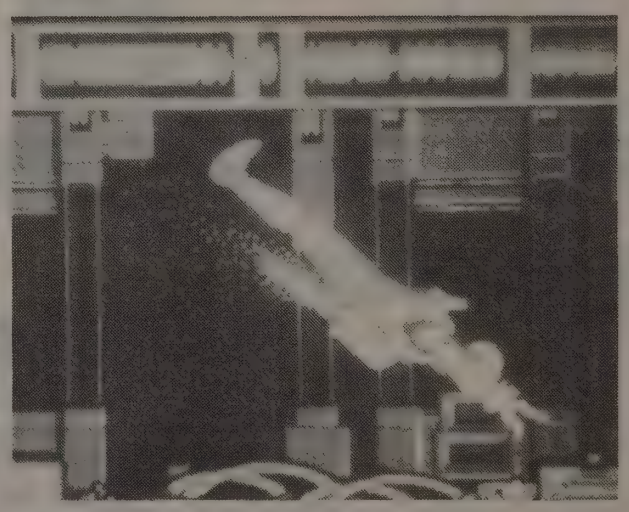
The optimal strategy for Blackjack is expressed as a complex series of rules. This modest little program drums these rules into the user's brain with relentless efficiency.

Blackjack is a card game of such childish simplicity that you might think it hardly requires a tutorial, but, like any game of chance that offers the hope of gain, it has been subjected to profound statistical analysis.

The optimal strategy for Blackjack is expressed as a complex series of rules. This modest little program drums these rules into the user's brain with relentless efficiency.

The opening menu allows you to select a basic game, novice practice, advanced practice, compute and display various probabilities, or test particular playing strategies.

The text-based graphics are rudimentary, but the program is well-organized, complete, and enjoyable to use. It seems like a good investment for anyone planning a Nevada gambling spree. (William E. Blachly, 148 W. 23rd St., Suite 7-A, New York, NY 10011. 212/255-4033)



The Auto City level, for example, is a junkyard of damaged and obsolete transport equipment, populated by hostile aliens.

ROTOX

Designed By: Mick West, Dave Leitch & Nick Vincent
Published By: U.S. Gold
Distributed By: Accolade
For: IBM PC and compatibles (CGA, EGA, VGA, 512K), Amiga version also available
List Price: $39.95

This British import is a futuristic shoot-em up, set on a labyrinthine space station full of rotating and pulsating platforms. The overhead perspective view is centered on your heavily armed and armored Cyborg

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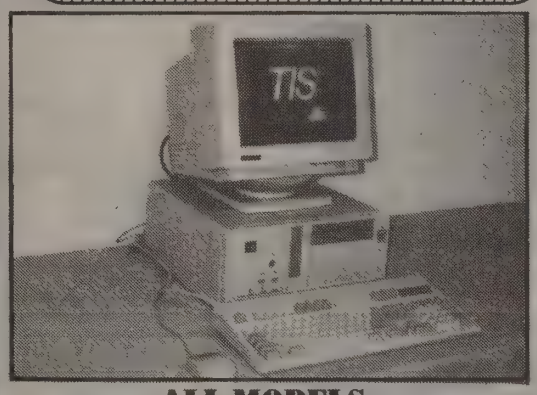

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warrior as you move around, dishing out destruction to swarms of robotic killer bees, Realtors, and other loathsome life forms.

I was lying about the Realtors.

There are ten increasingly nasty levels, full of challenging and humorous puzzles. The Auto City level, for example, is a junkyard of damaged and obsolete transport equipment, populated by hostile aliens.

The user interface is very simple—you press "Q" or "A" to move forward or back, "O" or "P" to turn left or right, and the spacebar to fire. Neither the numeric keypad nor the cursor arrow keys (if you've got 'em) are supported. Very bad idea, U.S. Gold. F1 pauses the game, when you need to catch your breath. ROTOX supports joysticks, but not mice. Copy protection involves entering a code from the manual during startup.

Three 5.25" disks and two 3.5" disks are included in the package. Regardless of your graphics card, it seems that you have to copy all the files (less than 1MB) onto your hard drive or the game won't run. Documentation includes a background science fiction story, somewhat in the tradition of Heinlein's Starship Troopers.

ROTOX is stylish, intense, reasonably priced, and extremely well-programmed.

PC SOFTWARE REVIEW

WHEREABOUTS DELUXE

Published By: ArtSoft
List Price: $99.95, Vol. 1&2
Reviewed By: Woody Liswood

Whereabouts Deluxe is a TSR screen save message maker that lets anyone who looks at your computer screen while you are away know what you're doing. It works under DOS and also comes with a Windows PIF file.

Whereabouts Deluxe also allows people to leave messages on your computer. To ensure that you know a message was left, an envelope appears on the screen.

It is a series of cute screens with messages, such as "back at," "call me at extension," "out to lunch." Whereabouts Deluxe contains two volumes of message screens with twenty-one different messages.

After you select a message, Whereabouts Deluxe asks you to personalize your message, such as what time you will return or what extension you will be at. If you want Whereabouts Deluxe to also act as a screen saver you can specify how long you want the message displayed before the screen saver—a "snoozing" PC—goes on.

Whereabouts Deluxe also allows people to leave messages on your computer. A "press space bar to leave a message" icon can be displayed. To ensure that you know a message was left, an envelope appears on the screen.

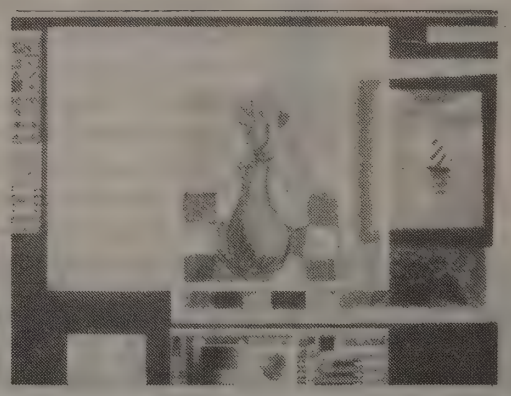
You can also set a password that allows only you to activate Whereabouts Deluxe and return to your computer.

This is a useful little program that, in a busy office, can be a great help if you are always running around and are never at your desk to meet visitors. The only drawback with Whereabouts Deluxe was that the screen images seem a little too cutesy after using them for awhile. We've got a rather small office and may simply bore easily. In a larger office, with lots of folks busily running around, the screens should stay interesting longer. (ArtSoft, Inc., PO Box 658, Marlboro, MA 01752. 508/485-9530)

MACINTOSH SOFTWARE REVIEW

OASIS 1.0

Published By: Time Arts
For: Macintosh
List Price: $795
Reviewed By: Matthew Leeds



Lumena has given Time Arts a reputation for great image creation software in the MS-DOS market. They have now moved that expertise to the Mac with the release of Oasis, a program designed to emulate the traditional tools used by artists in other media. Oasis brings a powerful set of techniques such as pressure-sensitive brushes with variable size, density, wetness, and dry-out speed. It provides excellent support for video artists; with direct control over the RasterOps 364 and TrueVision NuVista video capture boards.

Oasis also adds some well-thought-out ideas to the crowded paint program party. These additions include a "video-legal" palette that can be enabled, the ability to mark off video safe areas, well-designed support for linear keying and alpha channel, anti-aliased text that can be added, and a unique tool, LightBox, that provides the ability to overlay two image documents and render the top one transparent for tracing the underlying images.

There is also support for many of the recent innovations seen in other programs: Tear-off menus, floating tool palettes, multiple color spaces, a variety of fills and gradations, masks, brightness and contrast controls, and multiple open documents. Oasis also supports Photoshop acquire and export plug-ins, and ATM.

As is often the case in a first release, there are a few rough edges and missing features. Oasis lacks a zoom feature, something I sorely missed for fine control and cleanup. Unlike Photoshop, it lacks built-in virtual

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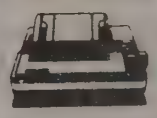

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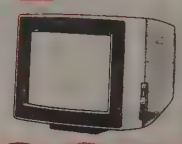

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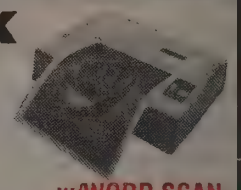

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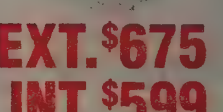

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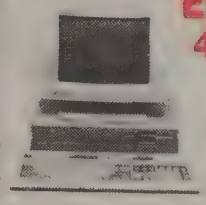

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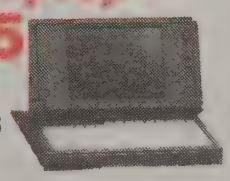

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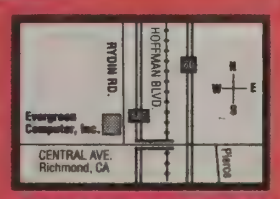

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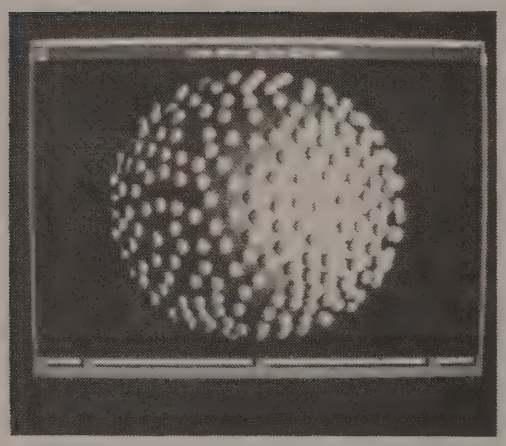
memory capability, but with the imminent release of System 7.0 this will soon be a moot point. The screen redraw is sometimes slow and occasionally artifacts remain on-screen. Although Oasis does not support rotating or flopping selected areas of the image, I did find the poorly documented scale selection process.

Oasis is an amazing program and well worth having even if you already use another paint or image package. The Wacom pressure-sensitive tablet is an absolutely necessary peripheral to Oasis, and you should get both to take advantage of the pressure-sensitive functions in Oasis. (Time Arts, Inc., 1425 Corporate Center Pkwy., Santa Rosa, CA 95407. 707/576-7722)

THE GUINNESS DISC OF RECORDS 1990

Published By: UniDisc
List Price: $99
Reviewed By: Matthew Leeds

Based on the all-time best selling Guinness Book of Records, this Hypercard CD-ROM brings our world to life. Records contained on the disc provide a source of authenticated facts covering everything from the scientific world to sports, games, and pastimes.



The disc contains over thirty full-screen color and black-and-white animations; over 350 photographs, music, and sound effects; and over four thousand records and tables. The complete text is indexed and searched using a HyperKRS search engine, a Hypercard add-on from Knowledge Set Corp. This dramatically improves search times from the basic Hypercard search capability.

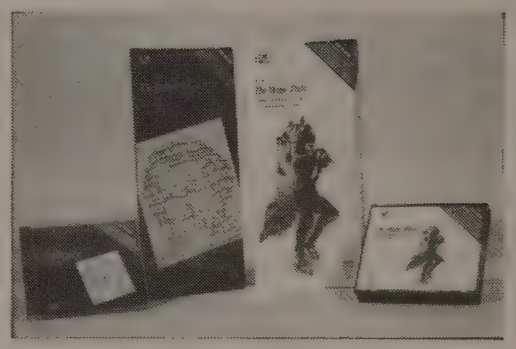
Information can be accessed several ways. You can explore through the outline index that is divided into three categories—what, who, and where—using a full boolean search for any text on the disc; select a random record on the disc; or watch a slideshow of pictures stored on the disc. When you see a picture you are interested in, you can click on an 'info' button and see the text record associated with the picture.

UniDisc recently signed an agreement with Britannica Software for exclusive worldwide distribution rights to the Guinness CD and a new version that will use the same front-end as the Compton's Multimedia Encyclopedia, also published by Britannica. (UniDisc, Inc., 3941 Cherryvale Ave., Suite 1, Soquel, CA 95073. 408/464-0707)

MOZART: THE MAGIC FLUTE
BEETHOVEN: THE STRING QUARTET

Published By: Warner Audio Notes
List Price:$66
Reviewed By: Matthew Leeds

If you've spent any time paying attention to developments in the CD-ROM market, you've heard the phrase "multimedia." It's overused, usually undefined, and mostly falls into the same category as "new and improved" and "family size." However, if you want to see and hear a great example of what multimedia is and what makes it so compelling, check out the Warner Audio Notes offerings.



The complete Magic Flute opera spans three CD's, includes over seven thousand Hypercard screens that provide a complete translation of the German singing, spoken summaries either in German or English of the dialogue between songs, complete dialogue transcript, and a long-form analysis of the music with buttons that play specific parts of the opera while explaining it. There's also a sound glossary in which you can read and hear terms, a character index with histories and symbolism, and even a test that lets you discover what you learned about the Magic Flute.

The String Quartet includes a guided tour for beginners to the entire Quartet that describes musical concepts readily apparent to the listener without using musical terminology. There are also continuous commentaries on structural and harmonic analyses, a "graphical" analysis of the elements that make up the music, a quartet map that lists the movements, and a notebook for the user to add comments.

There are also additional biographical, historical, and musical insights, side journeys, and examples of sound and music that expand on the Quartet. A Musical Workshop demonstrates rhythm and meter and lets you create your own; an explanation of melody explores the subtle ingredients of tunes; and an index, glossary, and exam round out the disc.

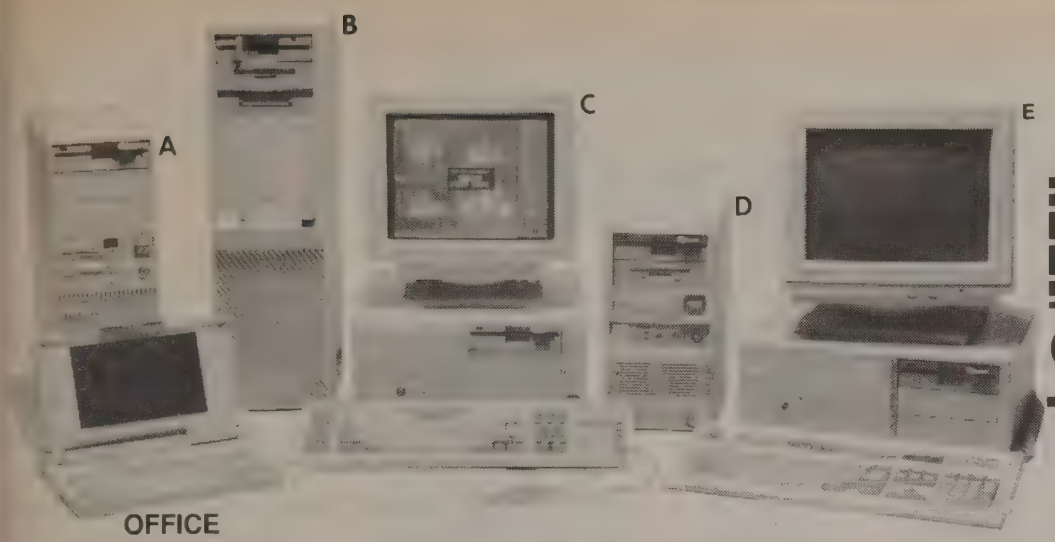
These two offerings are the first in a series of discs from Warner New Media. The next Audio Notes disc will be Brahms' "A German Requiem." These are all ambitious offerings and require a sizeable amount of your hard disk's real estate. The String Quartet stack is 6.5MB, and the three-disc set of The Magic Flute requires 11MB for all three stacks. This is necessary since you can't access both the Hypercard stack and the audio tracks off the CD simultaneously. If you've got the space available, I highly recommend these discs as they bring a new experience to the enjoyment of music. (Warner New Media, 3500 Olive Ave., Burbank, CA 91505. 818/955-9999)

COSMIC OSMO

Published By: Activision
List Price: $79.95
For: Macintosh
Reviewed By: Matthew Leeds

For everyone who played the floppy disk version of Cosmic Osmo for hours on end until they found every last

Continued



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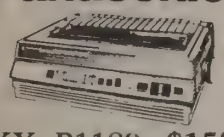

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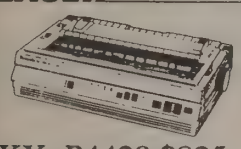

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Weighing in at 140MB of graphics and sound, the land of Osmo is a playground for both adults and children, where blind mice sing off-key and every nose honks.

path from here to there, listened to every last piece of music and funny dialog, clicked on every possible gadget and widget, the CD-ROM version promises to swallow up even more of your time. Weighing in at 140MB of graphics and sound, the land of Osmo is a playground for both adults and children, where blind mice sing off-key and every nose honks.

Osmo requires at least 1MB RAM, System 6.0.4 or higher, and Hypercard 1.2.5 (included on the CD). It's packed full of wonderful animations, places to explore, things to do, and characters to meet. It's sort of a Dr. Sesus meets Monty Python. You wander through a landscape where anything can happen and frequently does. Exploring is as easy as clicking on an object. The only downside to the CD version is that the response time, never great due to the use of Hypercard as an engine, is even worse owing to the slow speed of CD-ROM drives. Still, this is both a classic of the genre and a rich experience worth having. (Activision, Inc., 3885 Bohannon Dr., Menlo Park, CA 94025. 415/329-0500)

MACINTOSH HARDWARE REVIEW

IIR CACHE EXTENDER CARD

Manufactured By: IIR, Inc.
List Price: $399, FPU $100

PSI 030 BUS ADAPTER CARD

Manufactured By: PSI Integration, Inc.
List Price: $95, FPU $120, Cache memory $495 (PSI offers the 030 Bus Adapter Card, Cache-It! RAM cache card, and FPU math coprocessor bundled together for $545)
Reviewed By: Matthew Leeds

Choosing the Macintosh IIsi meant making some difficult choices. While new IIsi owners opted for the least expensive Mac II class machine, they now have only a single expansion slot to work with. Once this slot is filled, that's it, you need to make a careful analysis of the available options. Most people will select from the variety of NuBus cards that are also available for the IIsi's big brothers, and some will have needs that can be filled by the Processor Direct Slot (PDS) cards for the SE/30—mostly video and network cards. However, there is another set of choices that you must remember.

In most cases, to add a card to the IIsi you need an adapter. Apple offers a PDS adapter that includes a math co-processor chip—also known as a floating point unit or FPU. Adding an FPU can speed up some applications. It's best at helping number crunching applications such as scientific modeling, ray tracing, statistical analysis, and some spreadsheet work. The average program, however, doesn't benefit much from an FPU. In these cases, if you want your Mac to work faster, you'll need a memory cache add-on card.

It's important to understand the difference between the RAM cache found in the Control Panel and the memory cache I'm referring to. The Control Panel RAM cache sets aside a portion of your Mac's memory as a cache for data from your hard disk drive. When an application wants a piece of data that is stored on the hard disk, if you've enabled the cache, it not only gets passed to the application, it gets stored in the cache. The second time that data is requested, it will come from the cache instead of from the drive. If the application requests new data, the old data may get flushed from the cache. The more memory you set aside for the cache, the more data that can be stashed there. Since it's much faster to read data from RAM than from a hard drive, performance improves.

The two adapters I tested offer another type of cache. They make use of a special type of memory chip called static RAM. This is high-speed memory similar to that used in the cache built into the IIfx. This memory can be accessed much faster than the system memory inside the IIsi. Both data and instructions can be stored in the memory cache, and like the RAM cache, they can get flushed of old data as new data and instructions are used. Cache size in an important feature, but there are limits to the maximum useful size. The 68030 chip used in the IIsi has two built-in caches, each of 256 bytes, one for data and one for instructions. The cache in the IIfx is 32K, and add-on cache cards for the IIci are usually either 32K or 64K.

The IIR Cache Extender Card has a 32K cache. It is available either with a FPU installed or with the socket left empty. The PSI Bus Adapter Card is also available with or without the FPU installed. In addition, the memory cache of 64K is an option, although an expensive one. Both are easy to install in under five minutes. The performance tests I ran (with an FPU) showed that both cards improved math intensive applications about the same rate.

In my real world tests with Photoshop, the larger cache of the PSI cards gave slightly better results. Several studies of caching technology have indicated that the optimum size of a cache is around 48K, but opinions differ. The higher cost of the PSI cache option may not be worth the small additional improvement. It's important to note that the IIR card's cache is not an option, it's part of the card.

If you've no intention of adding a card to the expansion slot of the IIsi, these adapters offer good performance improvements at a reasonable price. If you can live with the limited choices in PDS cards, then these adapters offer much better performance than Apple's, at a higher cost. The choice is yours. (IIR, Inc., 210 Dahlonega St., Cummings, GA 30130. PSI Integration, Inc., 851 E. Hamilton Ave., Suite 200, Campbell, CA 95008) ■

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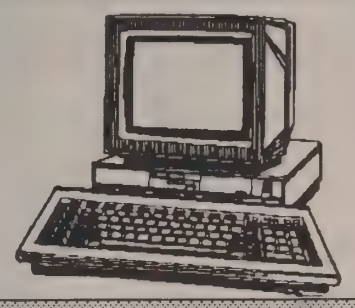

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- *1MB RAM on Motherboard
- *Middle Tower Case
- *200W Power Supply
- *386-25 Motherboard
- *IDE Controller
- *101 AT Keyboard
- *1.44MB Teac FDD
- *Built-in Clock

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- *1.44MB Teac FDD
- *Built-in Clock

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PC MAGAZINE

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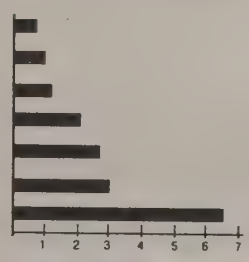
SpeedSTAR VGA™... the pacesetting facts

PC Labs Direct to Screen Test
test results in seconds



VGA Product Name	PC Labs VGA Benchmark Tests: Direct to Screen	BIOS w/o Scroll	BIOS w/ Scroll
Diamond *SpeedSTAR VGA*™	**0.71**	0.77	1.43
* Compaq 386/33 built-in VGA	**0.99**	0.33	0.93
Video Seven VGA 1024i	**1.21**	0.93	1.60
Paradise VGA 1024	**2.09**	2.04	3.96
Everex Viewpoint VGA	**2.69**	1.54	2.64
Orchid ProDesigner	**3.02**	6.26	7.80
* IBM PS/2 70 built-in VGA	**6.53**	0.66	3.40

test results in seconds
using Everex 386/16 except as noted by *

Extended Graphics Modes	Pixels	Colors	Display	DRAM Required	Monitor Timing
* interlaced	1024x768*	16/256	VE,AD	512K/1M	31.5KHz/39.0Hz
** SpeedSTAR+ VGA Only	1024x768*	16/256	VE	512K/1M	35.4KHz/44.0Hz
	1024x768	16/256	VE	512K/1M	48.9KHz/60.0Hz
	1024x768**	16/256	VE	512K/1M	56.5KHz/70.0Hz
	800x600*	16/256	VE,AD	256K/512K	31.5KHz/48.0Hz
	800x600	16/256	VE	256K/512K	35.4KHz/56.0Hz
	800x600	16/256	VE	256K/512K	37.9KHz/60.0Hz
	800x600	16/256	VE	512K/1M	48.1KHz/72.0Hz
	640x480	16/256	VE,AD	512K/1M	31.5KHz/60.0Hz
	640x480	16/256	VE	512K/1M	35.4KHz/66.0Hz
	640x480	16/256	VE	512K/1M	37.6KHz/72.0Hz

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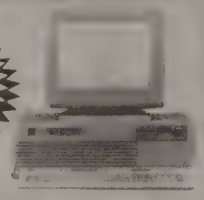

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- Small Footprint Case with 200W Power Supply

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120MB HD	2225
200MB HD	2440

OXFORD 386/33
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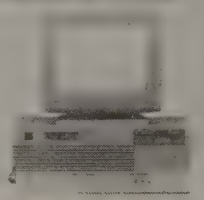

- 1 MB RAM
- 2 Serial, 1 Parallel
- 1 Clock
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave 2HD/FD Controller
- 101 Keyboard
- Small Footprint Case with 200W Power Supply

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120MB HD	1469
200MB HD	1719

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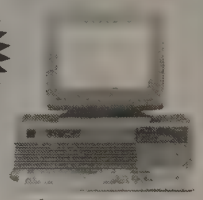

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386S	4MB add on module	112534-001	310
386/20e & 25e	1MB MEM EXP BRD	113644-001	199
386S	1MB MEM EXP BRD	113633-001	199
386/20e & 25e	4MB MEM EXP BRD	113645-001	499
386S	4MB MEM EXP BRD	113634-001	499
386s/20; 386N; 286N	1MB MEM EXP BRD	118688-001	119
386s/20; 386N	2MB MEM MODULE	118689-001	225
386s/20; 386N; 286N	4MB MEM MODULE	118690-001	550
286N; 386N	0-16MN EXP BRD	118700-001	115
386/33;486/25;SYS PRO;33L	2MB MEM MODULE	115144-001	210
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LASER PRINTER 4019;4019E	2MB CARD	1039137	350
LASER PRINTER 4019;4019E	3.5MB CARD	1038675	$450
50;50Z;60;55sx;55LS;65sx	2-8MB EXP BRD	6450609	495
70;50Z;55SX;55LS;65sx	2MB MOD	6450604	150
70-121-061-E61;55sx;55LS;65SX	1MB MOD	6450603	109
55sx;55LX;65sx;EXP CARD	4MB MOD	87F9977	399
80-041	1MB BRD	6450375	129
80-111;311;121;321	2MB BRD	6450379	199
PS/2 25/286; 30/286	512K UPGRADE	30F5348	55
PS/2 25/286; 30/286	2MB UPGRADE	30F5360	160
PS/2 MODELS 70;80	2-8MB EXP BRD	6450605	485
PS/2 MODELS 70;80	2-14MB EXP BRD	34F3077	448

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MODEL	UPGRADE	MFG P/N	PRICE
LASERJET IIIsi	1MB MOD	C2063A	$125
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LASERJET III; IIID; IIP	1MB UPGRADE	33474B	99
LASERJET III; IIID; IIP	2MB UPGRADE	33475B	150
LASERJET III; IIID; IIP	4MB UPGRADE	33477B	250
LASERJET II; IID	2MB UPGRADE	33444B	150
LASERJET II; IID	4MB UPGRADE	33445B	250

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EXEC NOTEBOOK	4MB MOD	500814-003	689
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PREM WS386sx; BRAVO.286; WS286	512K KIT	500510-010	55
PREM 286 FASTRAM	512K KIT	500510-001	$55
PREM WS386sx BRAVO286/386	2MB KIT	500510-002	130
PREM 386	1MB KIT	500510-003	100
PREM 386/25; 33	1MB SIMM	500718-002	85
PREM 386; RAM PLUS/MC	4MB KIT	500510-004	360
BRAVO 486/25	2MB KIT	500718-004	240

OKI DATA

MODEL	UPGRADE	MFG P/N	PRICE
OKI LASER 400	1MB UPGRADE	7001-4701	$150
OKI LASER 400	2MB UPGRADE	7001-47002	220
OKI LASER 800;820	1MB	7001-5201	230
OKI LASER 800;820	2MB	7001-5202	390
OKI LASER 800;820	3MB	7001-5203	440
OKI LASER 800;820	4MB	7001-5204	499

APPLE

MODEL	UPGRADE	MFG P/N	PRICE
MAC SI	8MB KIT	M0513LL/A	$550
MAC SI	2MB KIT	M0514LL/A	375
MAC IIfx	4MB KIT	M0376LL/A	350
MAC IIdfx	16MB KIT	M0377LL/A	1095
MAC CLASSIC	1-3MB EXP	M6361LL/A	125
MAC PORTABLE	1MB BOARD	M0248	250
MAC PORTABLE	2MB BOARD	M0249	750
MAC PORTABLE	3MB BOARD	M0250	999
MAC PORTABLE	4MB BOARD	M0251	1295
MAC II, IIcx; PLUS;SE;SE/30;IIsi	1MB KIT	M0218	89
MAC PLUS;SE;IILC;CLASSIC	2MB KIT	M0219	120
MAC II;IIcx;PLUS;SE;SE/30;IIsi	4MB KIT	M02707	240
MAC IIci; IIsi	4MB KIT	M0292LL/A	240
MAC IIci; IIcx;IIx;IIsi	16MB KIT	M0293LL/A	1095
LASER WRITER II/NTX	1MB KIT	M6005	150
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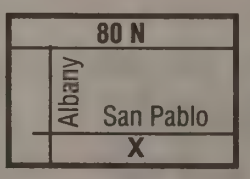

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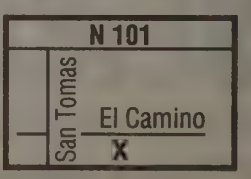

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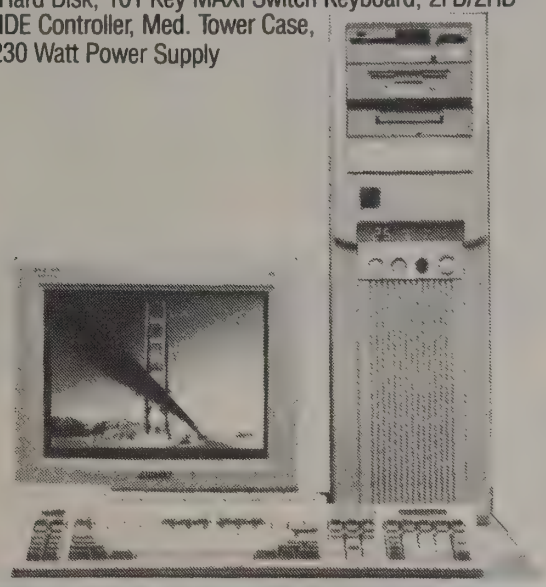

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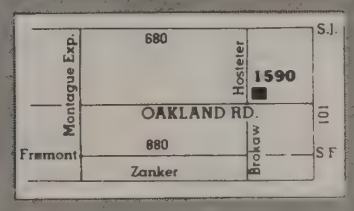

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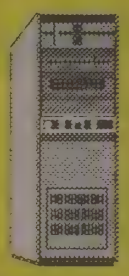

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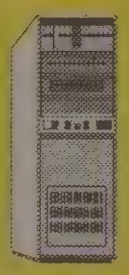

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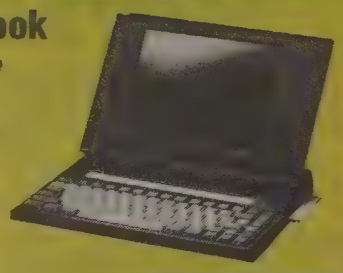

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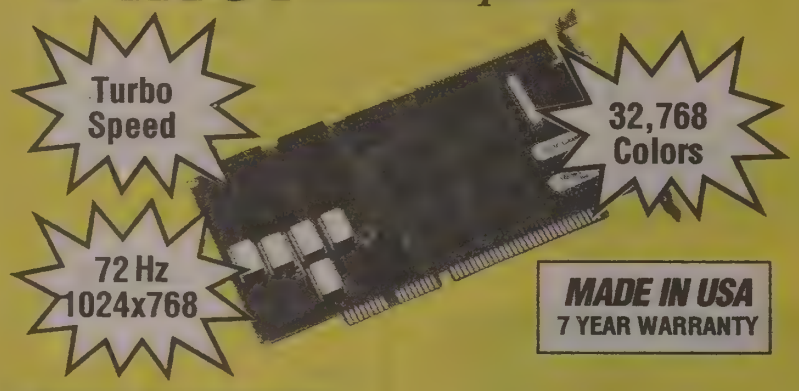

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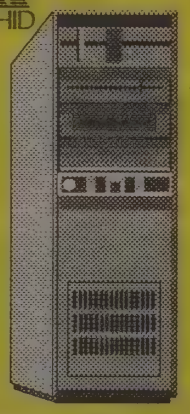

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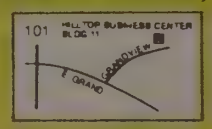

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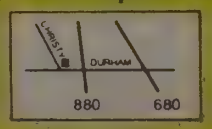

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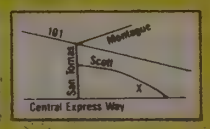

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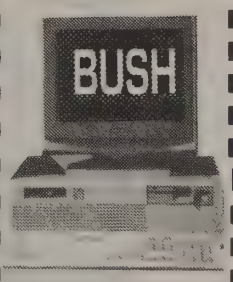

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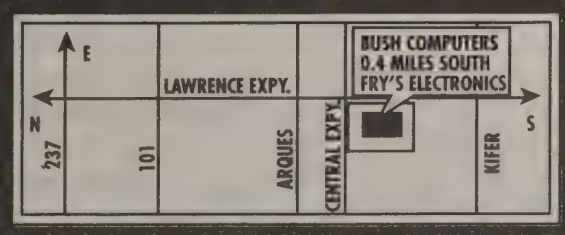

The Online Gallery

Russell Country BBS

BY ADAM GAFFIN

If you're an artist, you tend to want people to see your work. If you live in a remote, rarely visited part of the country, the challenge of reaching your potential audience calls for ingenious solutions.

Since last December, several Native American artists from isolated reservations in Montana have been addressing this problem, working with a computer-graphics program rather than more traditional paints. They "hang" their work in an online gallery on the Russell Country bulletin board system in Hobson, MT, named for the western artist C. M. Russell (modem number 406/423-5433, FidoNet Node 1:346/7).

Indian Share-Art Project Preserves Culture, Helps Local Artists Show Their Work

The work is available for downloading as "share-art." As with shareware, if you like and keep what you download, you're supposed to send in a fee—in this case, $25 per frame, 85% of which goes to the artists.

Cynthia Denton, a local teacher, runs the BBS, which she set up with Frank Odasz and Dave Hughes—who had previously set up a statewide educational BBS network in Montana using low-cost PCs and FidoNet, a network developed by hobbyists.

Montana is huge and sparsely populated, and a FidoNet system would be ideal in linking the state's scattered Indian tribes, Denton says, letting them share stories and art and organize on issues of joint concern.

Montana's tribes share a rich cultural and artistic heritage that few outside the state know about; one of Denton's hopes for the project is that it leads to an online catalog of Montana arts and crafts that could spread this culture—and make some money for the artists involved.

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Adam Gaffin writes about personal computers for the Middlesex News *in Framingham, MA.*

Crow Design by Willis Tsosie
Willis Tsosie is a member of the Navajo tribe and is residing on the Crow Reservation. In addition to being a professional artist, Willis is also a student at the Little Big Horn Community College in Crow Agency, Montana, located on the Crow Reservation.

NAPLPS

The Indian artists paint with a graphics protocol known as North American Presentation Level Protocol Syntax (NAPLPS, pronounced "Nap-lips"), which Hughes has been promoting for several years. It offers finer drawing than the ANSI now used on many bulletin-board systems, but creates files far smaller than those needed for more sophisticated GIF and TIFF graphics pictures; it's device-independent and will display images using the best capability of the video card and monitor you're using.

The small size of NAPLPS files is a big advantage in Montana's rugged country, where phone lines are often less than reliable—a 4K file is likely to download quickly and error-free, while a 400K file might not make it through the line noise.

Another advantage of NAPLPS is that it supports animation and video images as well as still graphics. "The Story of the Vanishing Braves," adapted by Hughes and Minerva Allen, who lives on the Ft. Belknap reservation, is a children's story written in English and Assiniboine, the language of an Indian

Montana's tribes share a rich cultural and artistic heritage that few outside the state know about; one hope for the project is that it leads to an online catalog of Montana arts and crafts that could spread this culture—and make some money for the artists involved.

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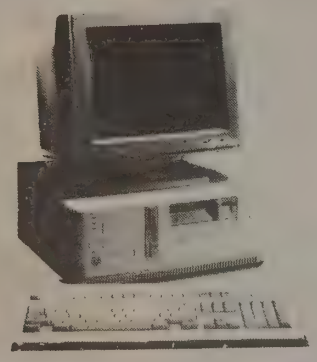

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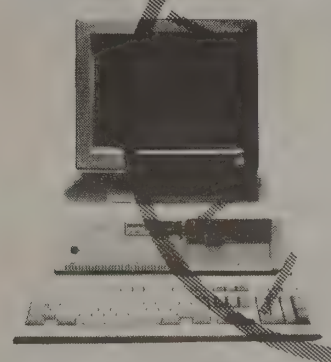

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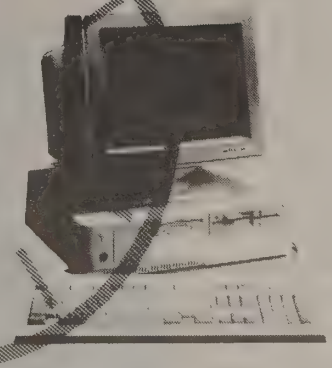

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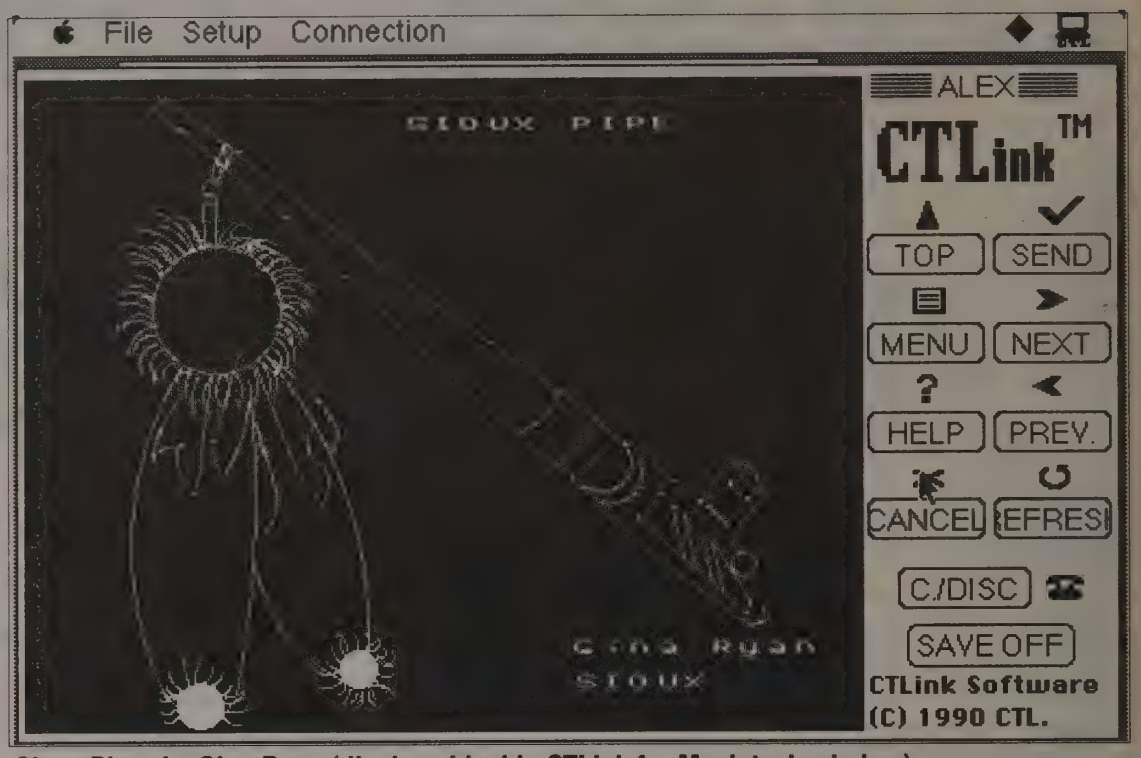
Computerland of Canada sells a Mac terminal program called Tan Tan for $109 Canadian (about $85 US) designed for the Canadian Alex service, which uses NAPLPS. An MS-DOS version called Forum is available for $85 Canadian. Computerland of Canada: (416)793-1111.

Microstar of Canada sells Micrographics Editor, an MS-DOS program to create NAPLPS graphics on any machine with a graphics card (including laptops) and a mouse or Summagraphics tablet. Dave Hughes handles its distribution in the U.S. and sells it for $175. His email address is dave@well.sf.ca.us.

CTL Communications of New York sells CTLink, an MS-DOS communications program that lets users connect to VT100 (which should let it work with most text-based online services and BBSes), Minitel, and NAPLPS systems, and recently released a Mac version. The MS-DOS version of CTLink sells for $44.95, which includes postage and handling. The Mac version of CTLink costs $64.95. Both include such features as screen saving and scripting for automatic logons. CTL Communications: (212)979-8553.

tribe in Montana. It tells the story of a brave who goes into the forest to find out why all the other braves have disappeared. It uses large print and line drawings to tell its story. The "pages" of the story turn themselves, and the drawings update as the story progresses.

Currently, however, few people have ever heard of NAPLPS, and it goes unsupported by the more popular communications packages. Still, Hughes says it is only a matter of time before some creative hackers get around to developing the low-cost packages that would make a NAPLPS explosion possible. He notes that Alex, a Canadian videotex system, uses NAPLPS and that Prodigy, the IBM-Sears joint venture, uses a variant of it.



Sioux Pipe, by Gina Ryan (displayed inside CTLink for Macintosh window)
Gina Ryan is a member of the Sioux tribe. As well as being a professional artist, Gina is a student at the Fort Peck Community College in Poplar, Montana, which is located on the Fort Peck Reservation.

In the meantime, the Russell Country BBS does offer CTLink, a shareware MS-DOS communications program by CTL Communications of New York that lets you view downloaded share-art files or view them online—although the latter is somewhat risky (to say nothing of expensive, given the long-distance charges), since the least bit of line noise disrupts the drawing and creates bizarre results on the screen. The program is not nearly as smooth as, say, Procomm—every time you tell it to perform a command, it blinks disconcertingly first—but is easy enough to learn after five minutes or so with the help files that come with it. (See sidebar for more information on downloading files.)

A FLEDGLING PROJECT

Denton says she realized the artists were committed to the project when they drove several hours for a conference on computer art last December in Billings, despite an impending snowstorm that tripled travel time.

Although few Native Americans have home computers, all of the community colleges that serve the reservations—there is one college on each reservation—do have the machines, she says. Ideally, she'd love to see an Internet link, but for now, the reservations use FidoNet.

Most of the pieces online as of late May were done at the Billings conference, using the Micrographics Editor from Microstar of Canada, and a Summagraphics tablet.

Hughes emphasizes that the pieces now online are early works: "Until those artists do a few more and start to really integrate their art with the technology, such as animation, I don't want the first work to be judged too harshly."

For this and other reasons, Hughes and Denton are not currently distributing the graphics files to other systems. "I feel a great responsibility to make sure the 'share-art' idea gets shaken down on the Russell Country BBS before simply posting the files on a bunch of Fido BBSes, the vast majority of whose sysops are interested in techie stuff, not art, much less the fact that this first group of Indians live on reservations with 75% unemployment," Hughes says.

"There's more significance there in this share-art concept," he adds. "It contains the seeds of a whole way to deal with 'small electronic publishing' pieces."

Family design of Iron-Belly, Crow Indian by Courtney Stewart
Courtney Stewart is a member of the Crow tribe. As well as being a professional artist, Courtney is a student at the Little Big Horn Community College

An elementary school teacher, Denton has used telecommunications to link third- and fourth-graders in Montana with students in Japan. Denton says she places great hope in the idea of "distance learning," of connecting students in rural areas such as Montana with experts and scholars in the big research universities. She's enthusiastic about a project in which MIT fusion researcher George Johnston has been leading classes on chaos theory for high school students in Montana, Wyoming, and Colorado, all online.

"That's what we're hoping to do, because we need it desperately," she says. "People aren't going to come here as a general rule." ■

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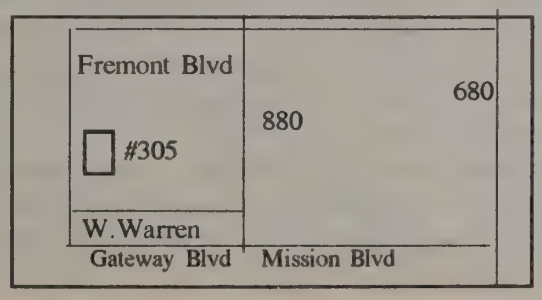

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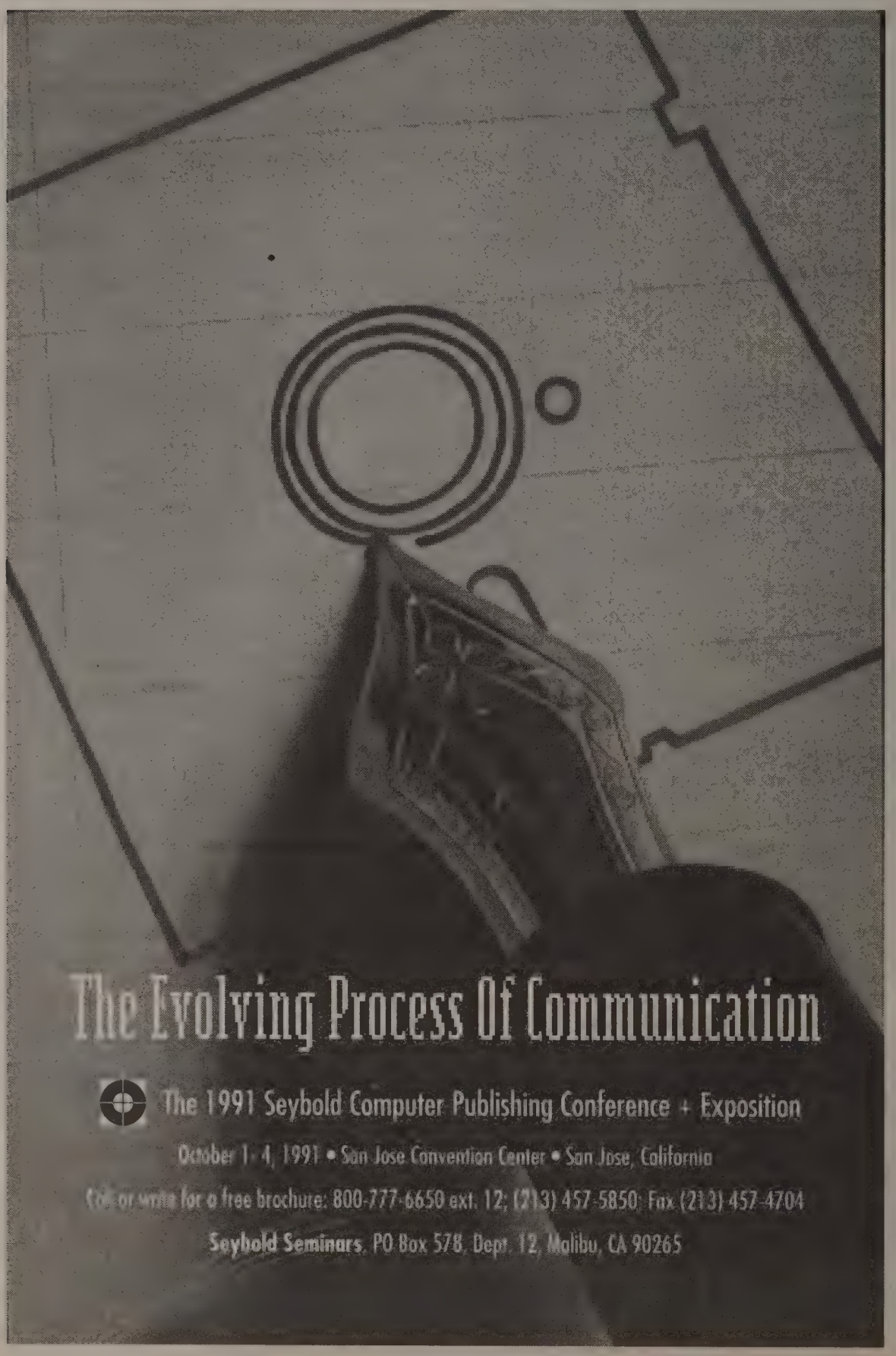
"They're a magazine, why don't they take a photograph?"

More Tales Of Graphics Conversion

Dave Hughes is a big fan of NAPLPS. Dave Hughes, on the other hand, is also a big fan of the notion that hard copy is obsolete, having, among other things, pioneered an online poetry form known as Word Dance.

Consequently, as this article progressed, we got more and more worried, because low-tech though it may be, paper is what we use.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And as deadline approached, things were looking grim. Adam Gaffin, who's in Massachusetts, succeeded in downloading artwork from Russell Country with CTLink on his PC, and was able to view the files on his screen. He could not, however, print them. What he could do was upload the files to The WELL so I could download them to my Mac, but once they'd arrived, it became clear that none of the marvelous Macintosh graphics software in the office knew from NAPLPS.

It was at about that point that a certain software vendor made the suggestion that we take a picture of the monitor. Having been happily command-shift-3ing our way to heaven for some time now, and also having grave reservations about transcontinental screen photography, we wanted something better.

So at that point we threw ourselves on the collective mercy of the participants in The WELL's Macintosh and PC conferences (415/332-6106 modem, 332-4335 voice info). The consensus was that what could be viewed could also be screen-captured and converted to some PageMaker-usable format, and that several screen-capture utilities were available commercially and as shareware for both PC and Macintosh.

It would have been possible to capture and convert the PC screens to, say, GIF or TIFF format, then translate those files to their Mac equivalent. As it turned out, we didn't do it that way. Instead, I got a beta copy of CTLink for the Macintosh from CTL Communications.

Using the Alex mode of CTLink, I was able to view the files Adam had sent—somewhat amazing to me, since they were raw text files. While viewing them on the SE/30 gave a general idea of what they looked like, the art appeared to much better advantage on a color system.

Using the shareware program Snap 2.1, it was then quite easy to take color snapshots (PICT format) of the art, then import it into a graphics program and save it as TIFF, both color and greyscale. In the process, it emerged that NAPLPS was hard to beat when it came to disk consumption: a file that took less than 5K in NAPLPS is 357K in TIFF.

In general, we'd recommend using your regular telecommunications package rather than CTLink to access the Russell Country board; CTLink does not download files per se, though it will let you view and save them through a somewhat arcane process. Since Russell Country supports X-, Y-, and ZMODEM transfers, it's much quicker just to download any files you might be interested in, then view them offline with CTLink and decide what you want to keep.

—Mary Eisenhart

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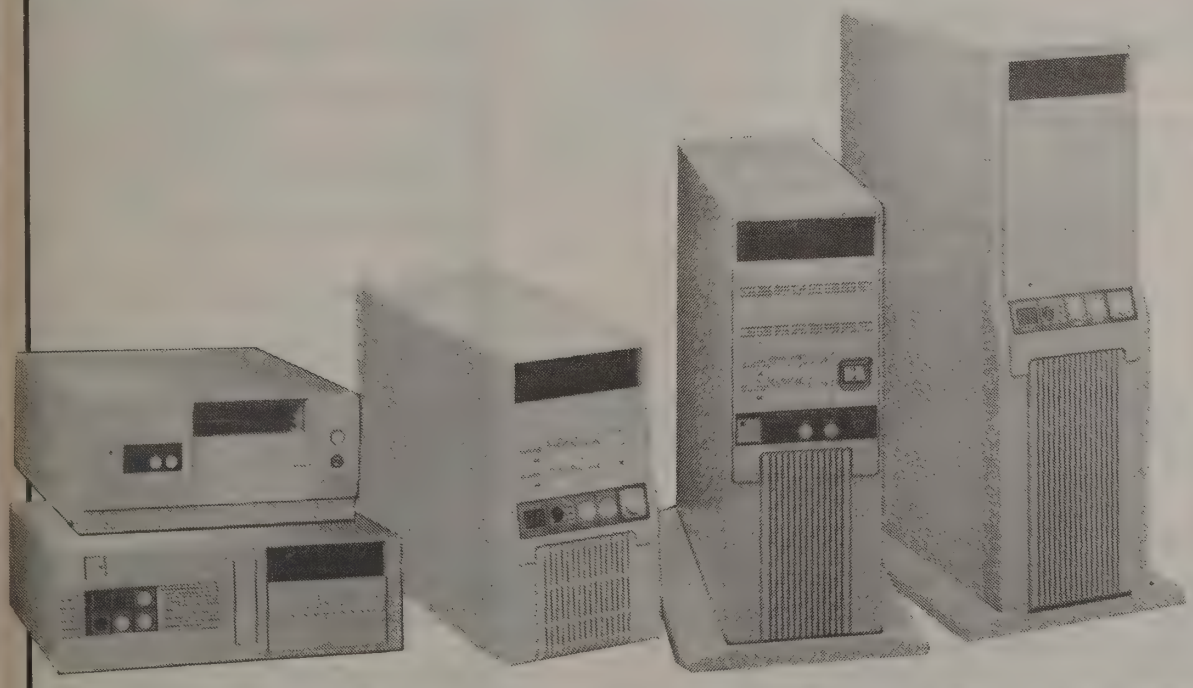

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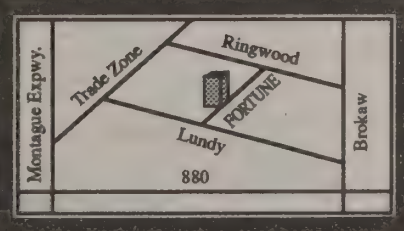

Adventures In System 7

Chairman Bill Meets The BMUG Peanut Gallery

BY DAVID MORGENSTERN

It's started—the System 7 flashflood washing over my hard disk drive and into my outdated brain. Fortunately the pain and pleasure of the new software make short work of operating system shock syndrome. All we've gossiped about for the last year is Seven Point Oh this, System 7 that—what are we going to do now? Loiter at the 7-11? Fill out bug reports? Get a life?

SYSTEM SEVEN POINT OY

Our hallowed BMUG tradition speaks of four children, one smart, one foolhardy, one naughty, and one a new user. One day, their mother, a now-reformed blue box hacker from way back, asked each to investigate System 7, and report back to her with their discoveries.

BMUG

The smart one returned with a detailed knowledge of System 7 capabilities, incompatible programs, and networking. She said, "Even though I have a fully loaded Mac IIci, and a high capacity drive, I think I'll wait a few months before installing the new system. I'm a little nervous about my hard disk driver software." Her mother exploded, "Who do you think is going to help the rest of us with our problems, if you're not running System 7? The family and BMUG members calling the volunteer HelpLine are counting on you to pull us out of the upgrade swamp!" The brainy, but cautious daughter went right out and installed the software. And crashed.

The foolhardy child burst in the room yelling, "System 7 sounds like the greatest thing since McDonald's Fried Sushi Plate! I'm going to load it on my Mac right now." The mom dragged the impetuous lad by the ear over to his desk, pointing at his Mac Plus. "You're running a 1MB machine, with software so old you've worn grooves in the original disks. Don't you have some important term papers due this month? No new system software for you until your work's done, RAM's installed, and you've paid off your Mastercard bill for all the application updates." The impulsive youth sulked over to his buddy's and played video games all afternoon.

Copyright © 1991 by David Morgenstern. All rights reserved worldwide. *David Morgenstern is a Bay Area "MacNurturer" and BMUG member. David is DMORGENSTERN on MacNET, 72030, 1607 on CompuServe, and himself at (415)549-BMUG.*

The naughty child strolled into the house. "My ReadySoft A-Max emulator card for my Amiga 2000 refuses to boot System 7! What do you think the problem might be?" His mother gave him a withering glance. "Don't we have enough System 7 problems without worrying about compatibility with a hacked-up board using gray market ROMs? Go ask an Amiga User Group!" The son pulled out all the stops, and cried, "You've never loved me, or my computer!" Which was a cheap shot, since the Amiga had been welcomed into the family, and GIFFs exchanged.

The new user child came in later with her new Macintosh LC. "I like my Mac," she said, "but I'm going to turn off the Help balloons. I don't need them anymore." Her mother smiled proudly, and kissed her on the cheek. "It's called Balloon Help, dear. And remember to back-up your data."

The moral of the story? Be smart, brave, close your eyes, and click your heels three times. There's no place like Home. But just to play it safe—buy some extra RAM, software updates, and some pain killers.

SEVEN SYSTEMS FOR SEVEN BMUGERS

There was no detectable hint of upgrade angst in the crowd packed into the San Jose Convention Center, waiting for the System 7 intro show to begin. Speakers blasted out fragments of *The Phantom of the Opera*, and some oddball light rock Gregorian chant. Someone in front of me commented that "the music was better this time," which was a terrifying thought.

The presentation started with a couple of ads. The first was a fake Macintosh ad from the television show *Saturday Night Live*. Some five-year-old kids look at drawings of monsters, jet fighters, and other goodies that one of them had produced on his computer. A have-not kid says that they're stupid. "No, we're not stupid. Our dads just bought us crummy computers." Macintosh—The Power to Crush the Other Kids.

This was followed by Apple's current ad campaign, the yelling college professor. He probably had his life savings in Apple (how

Her mother exploded, "Who do you think is going to help the rest of us with our problems, if you're not running System 7? The family and BMUG members calling the volunteer HelpLine are counting on you to pull us out of the upgrade swamp!" The brainy, but cautious daughter went right out and installed the software. And crashed.

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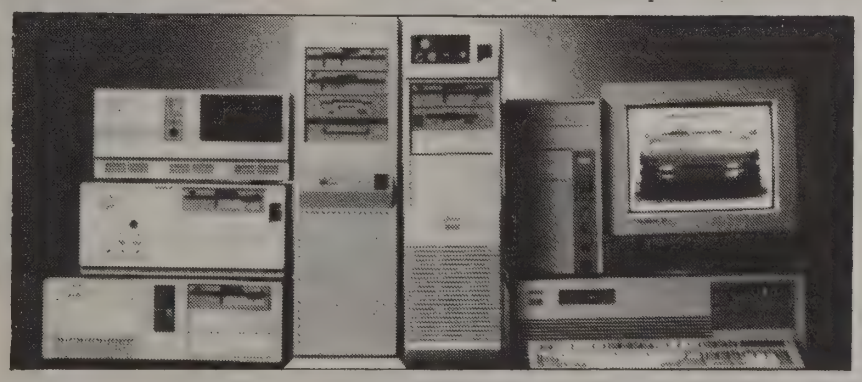

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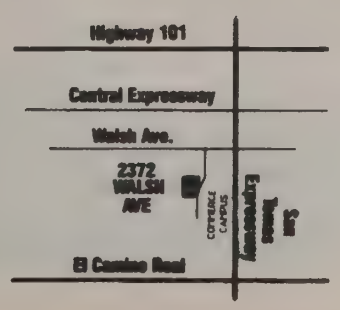

low will you go?) stock.

Finally John Sculley walked forward, dressed in fancy black slacks and a purple T-shirt. A fashion risk that was trying to say he's just an Advanced Technology Group hacker... Not!

An audience favorite was called the Office on My Disk. An alias was created of a hard disk on a Mac, and copied onto a floppy disk. The disk was carried across the stage to another Macintosh on the network, inserted, and double-clicked. All the files were ready to be used and accessed through the built-in networking in System 7. It was very slick.

A few vendors showed some new applications that exploit System 7 features. The first was Bill Gates, chairman and boss of Microsoft. He walked out wearing a blue shirt that Steve Jobs had given him at the 1984 introduction of the Macintosh. He said it was "still compatible." He reminded the audience packed with Apple employees, developers, and press, that after the first Mac developers conference all fifteen attendees had gone out to dinner.

The next "third-party" developer was Dan Eiler, president and CEO of Claris. He started off with a shot to Microsoft, saying, "Bill Gates brought down the Seattle weather for us (the rain), and when he leaves, we'll get the sunshine back." Danny obviously forgot that in a drought, rain is good.

Eiler showed a couple of unreleased products: Resolve, a new spreadsheet, and MacWrite Pro, the update to MacWrite II. As you might expect, since Apple owns the company, Claris products will have System 7 features in spades. The developers in the audience thought the Claris/Microsoft finger-pointing pretty lame. Small companies have trouble telling the two of them apart in the Macintosh marketplace.

Apple includes, as part of System 7, a HyperCard stack that analyzes the programs on your hard disk, and tells which have problems with the new operating system. Unfortunately, it incorrectly reports that Disinfectant 2.4 is incompatible, and recommends that you get version 2.5. There is no Disinfectant 2.5, and there won't be one!

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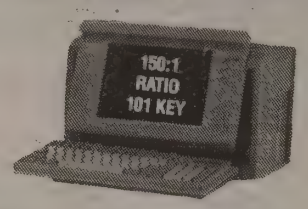

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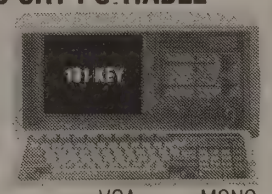

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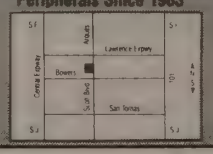

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column, upgrading to new system software is not hard to do—it's in the undoing that there's difficulty. Here are a few stray thoughts, and a couple of tips.

•New users will have little problem adjusting to System 7, and neither will users that have always operated with a plain vanilla Apple setup. Power users, people that have spent years customizing their desktop with INITs, CDEVs, and utilities, will have some painful withdrawal symptoms.

The new software incorporates many features found in commercial products, but not all, or in exactly the same manner. Users have spent countless hours getting things "right," learning little quirks and tricks. They've also shelled out big bucks for that privilege. These perfectionists will need some time to acclimate themselves to the System 7 implementation of their virtual body.

•John Norstad, the author of Disinfectant, the anti-viral program, has been pulling out his hair recently. Apple includes, as part of System 7, a HyperCard stack that analyzes the programs on your hard disk, and tells which have problems with the new operating system. Unfortunately, it incorrectly reports that Disinfectant 2.4 is incompatible, and recommends that you get version 2.5. There is no Disinfectant 2.5, and there won't be one!

John says that version 2.4 works fine with System 7, provided you leave the Disinfectant INIT in the System Folder proper. Don't move the INIT to the new Extensions Folder. He says there is one "small problem" with Disinfectant 2.4's custom Get File dialog, which lets you select a folder to be scanned. Don't try to select any files or folders in the new Desktop level in this dialog, or Disinfectant may crash. This is compatibility?

Version 3.0 will be out in the summer, with lots of System 7 goodies.

•Many programs, especially word processors, are bundled with utility desk accessories. Most of them are crippled to only work with a specific software package. If you want a thesaurus or dictionary to work with all your programs, you need to buy it separately. Unfortunately, almost all of these product specific versions break under System 7.

The software that kept track of desk accessories, DA Handler, has been sent out to pasture with the new operating system. When the DA is run, it bounces back with a message saying it will only work with its bundled program—even if that program is running. As you might expect, the message also contains an ad for the expanded, universally usable version. What to do?

The answer comes from the good ol' days of the Macintosh, before

UPCOMING EVENTS:

June 6	New Latitudes MasterPlan, Thunderware Thunderworks.
June 7–9	1991 National Apple User Group Conference. UC Berkeley.
June 13	AG Group Local Peek, NetWatchman (Networking management), Koei Corp. Bandit Kings of Ancient China.
June 20	Chris Crawford Patton Strikes Back, Microlytics InfoDesk.
June 24	BMUG West meeting at SF Exploratorium museum. Storm Technology Picture Press, Articulate Systems Voice Navigator.
June 27	Stewart Alsop PC Letter, Golden Triangle (disk duplexing card).
July 4	No BMUG meeting.
July 11	Farallon New Products.

•Your Expanding Infosphere Radio Show, Saturdays at noon, KALW-FM 91.7, has BMUG meeting announcements. Check it out!

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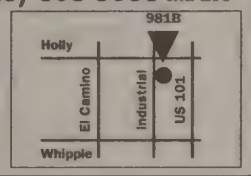

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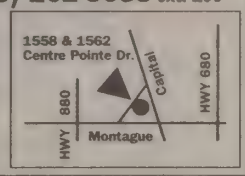

Suitcase and Font/DA Juggler. The System file was limited to only sixteen DAs, and people didn't want to waste valuable slots, or care to always view desk accessories that they could only use with one program. The Font/DA Mover program had a hidden feature to allow users to insert fonts and desk accessories directly into applications.

Run System 6.0x, and launch Font/DA Mover. Hold down the Option key when clicking on the Open button. Instead of a Font/DA exclusive list, everything becomes magically available to be opened. Copy the problem DA into its companion application, and everything will now work fine under System 7.

•BMUG is allowed to sell System 7 to its members. If you're already a BMUG member, you can get the ten-disk set and a book (the Peachpit Press book) for only $25. If you want to become a BMUG member, we have two membership specials with the new System. A six-month membership (our Newsletter, etc.) and System 7 is $45, or a year's membership is $55. They all come with a System 7 book. The software can be express shipped to you for an additional $15. Please call the BMUG office, (415)549-BMUG, for more information, or to order.

HE CAME. HE SAW. HE EXCEL'D.

Bill Gates was in town last month, and actually made it to a BMUG meeting! I was doubting all the way, wondering what I'd say to the six hundred eager beavers waiting at the

THE TOP TEN REASONS BILL GATES WAITED UNTIL NOW TO COME TO BMUG.

10. Supersaver fare at Greyhound requires seven-year advance purchase.
9. After antitrust and Apple lawsuits, may need to find living space at People's Park.
8. Wanted to get major bugs out of Word first.
7. With Steve Jobs and Philippe Kahn already in California, the weight of another ego might cause state to slip into Pacific Ocean.
6. Really preferred to go to the Stanford Mac Users Group, but both members were busy tonight.
5. Afraid BMUG might ask him to answer HelpLine calls for Microsoft products.
4. Heard rumor Atkinson and Hertzfeld would demo General Magic's new computer designed to make Windows look as ancient as their Macintosh made MS-DOS look.
3. Everyone is sick and tired of his Knowledge Navigator video.
2. Feared that Berkeley's bad reputation for psychedelic drug use would tempt key Microsoft programmers to relocate here.
1. Hoped to announce company's new line of condoms, but test marketing showed neither men nor women like the name Microsoft.

THE TOP 10 REASONS BILL GATES IS INTERESTED IN BIOTECHNOLOGY.

10. Mistakenly thinks it's biography creating software.
9. Industry with even longer lead times between product announcement and shipping dates.
8. Working to make a micro-soft toilet tissue a reality.
7. Likes to toss Petrie dish frisbees in clean-room laboratories.
6. Create some life in CD-ROM Industry.
5. Solid opportunity for strategic partnership with God.
4. Wants to get closer to all those foxy laboratory technicians.
3. "It's a living."
2. Only hope to remove embarrassing OS/2 Forever tattoo.
1. Believes dealing with FDA will be a piece of cake after BMUG meeting.

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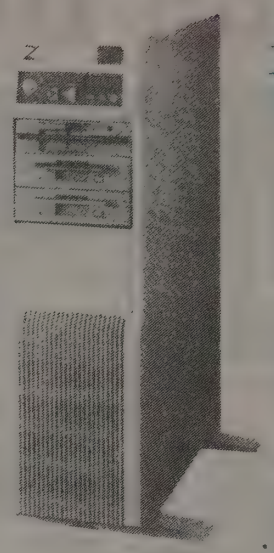

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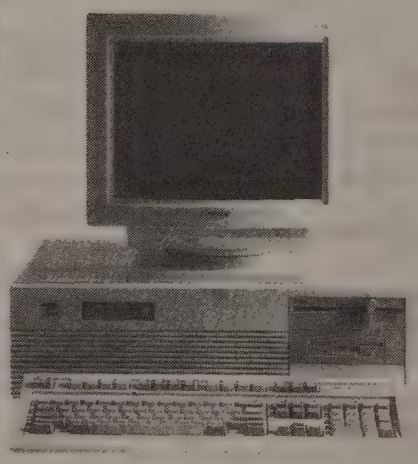

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Gates, if he didn't arrive. No one would ever believe that he, The Byte Rider, was caught in traffic.

Gates was killing time, waiting for the Computer Museum's third Computer Bowl, a trivia fund raiser. He was the official examiner for the show, filled with really difficult trivia. Here's a toss-up question: Which of the following sort routines was named after a person: Heap sort, Quick sort, Shell sort, or Bubble sort? Answer: Shell.

He gave an interesting talk on technology, demonstrated Excel 3.0, and generously answered questions for an hour. His anecdotes were colorful, since the history of Microsoft is, in many ways, the history of the personal computer business.

During the Excel demo, a member of the peanut gallery noticed that the spreadsheet wasn't formatting the numbers correctly, and pointed out the problem. Soon everyone picked up on it, and Bill had to turn his head to look at the screen projected behind him. No one could explain the anomaly—"We'll look into that," was his promise.

He also had to endure two BMUG top ten lists composed in his honor. The waiting one is by Scott Kronick, BMUG's Class-A wit, and the other by me. (The week before his visit, a newspaper had a long article on Gate's purchase of a biotech factory.) ■

What Is BMUG?

BMUG is an educational, non-profit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its ten thousand international members. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center Street (a half block from the BART Station) is open to the public 9 am to 5 pm. Please come by and say hello, meet other members, and hang out.

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BMUG has one of the most up-to-date, comprehensive software libraries around, with 600+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ Version II,* our library and more on CD-ROM.

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To get some further information about BMUG please write to: BMUG, 1442A Walnut Street #62, Berkeley, CA 94709. If you prefer to phone our business office call (415)549-BMUG, or FAX (415)849-9026.

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The CD-ROM Marketplace

Commodore's CDTV Takes The Challenge

BY MATTHEW LEEDS

AMIGA

Some of you may have noticed CDTV machines in stores in your area—four cities in California were selected for the initial rollout of CDTV. Since California often defines trends for the rest of the country, because Californians are early adopters of new products and show a propensity for high-tech gadgets, this is only appropriate. The race to win in the CD-ROM consumer market is on, and Commodore has an early lead.

This race has more sides to it than a Rubik's cube, and is in many ways more important than any other in recent consumer history. Take, for example, what has happened in recorded music. In 1983 vinyl discs (LPs and singles) accounted for 51.4% of the recorded-music spending. By 1988 that figure had fallen to 11.4%, almost completely due to the introduction of CDs, even though CDs had an installed base of only 25% of the homes. You might be interested to know that in the same year, casettes held 54.1% of the market, up 6.6% from 1983. And of course everyone is familiar with what happened to Beta videodecks. Once again, it's important to note that technically Beta was and is superior to VHS, but other considerations made VHS successful.

The race is worth a lot of money. In the last year, gross revenues from the sale of CD-ROM products rose to $1.5 billion, with most of the sales in the business market. There are currently over two thousand titles available, again mostly business titles for MS-DOS machines. Britannica Software has sold almost ten thousand copies of its Compton's Multimedia Encyclopedia, with an $895 list price disc.

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THE CONTENDERS

CDTV has as competitors three major players, and a fourth waiting in the wings. The first and best known is CD-I. CD-I has been in development for a long time, some say too long. It is based on an old operating system called OS-9, now modified and called CD Real Time Operating System (CD-RTOS). The hardware is based on an odd, 16-bit CPU, the 68070. The image format has neither the video clock rate of NTSC or a video clock rate that can produce square pixels. RAM is shared between the video display and the CPU; this slows down operations.

CD-I originally was going to be the only consumer CD-ROM platform. Phillips (the parent of CD-I) had an impressive consortium of partners committed to producing CD-I hardware. As development dragged on, the list of partners grew shorter. The last major partner, Sony, appears to have now developed its own CD-ROM strategy (see below). While CD-I has missed one release schedule after another, and while technology has marched ahead, the window of opportunity for Phillips has narrowed.

Microsoft took a look at this series of events, decided that it had an opportunity to make its own window, and announced specifications for a multimedia computer (MPC) that used Windows to support audio, animation, and CD-ROM. The base machine specs are for a 286 at 10MHz or better, 2MB of RAM, 16-color VGA, floppy drive and 30MB hard drive, CD-ROM drive, 8-bit audio, mouse, serial and parallel ports, joystick and MIDI ports (in, out, and through), and of course Windows 3.0 with multimedia extensions. This shopping list currently runs about $2,500. About a dozen hardware companies, including Tandy, NEC, Zenith, and AT&T, immediately announced their intention to deliver computers supporting the multimedia specifications.

There are some real pluses and minuses in the spec. On the minus side, the price tops the list. A 286 doesn't offer much in the way of horsepower, and the specs for the CD-ROM drive allow for an average access time of one second, much too slow for my taste. Sixteen colors is too small a display palette for many applications, even though the complete palette is 256 colors. On the plus side, having a hard drive to buffer data to will help the perceived access speed of the CD-ROM drive, and having a large data storage medium built in allows for much more than just high game scores to be saved. The high price of the system should keep it from being a major player in the consumer market.

The third player is Sony, which has announced a deal with Nintendo to develop a CD-ROM drive for the 16-bit Super NES coming this fall. The Super NES is a game machine, not a computer, but it is a great game machine. The color palette is the same as HAM mode, but with no color fringing. It has support for 128 sprites, independent scrolling multiplane backgrounds, coprocessors for scaling and rotation, and a digital signal processor (DSP) chip for stereo sound with excellent quality. The CD-ROM drive and game console are targeted

Copyright © 1991. All rights reserved. *Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

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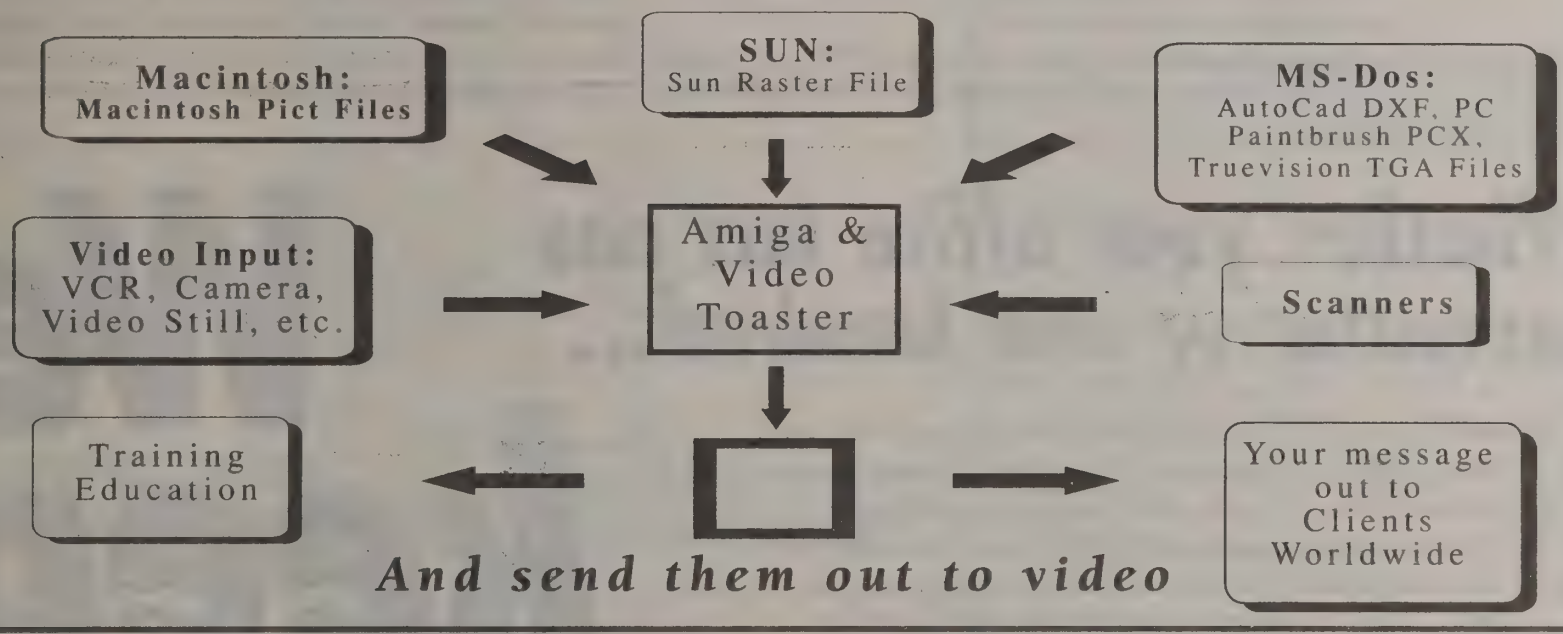

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Commodore has not been just waiting for its competition. They have developed new software drivers for CDTV that give it some impressive real-time video playback capabilities.

to list at a combined price under $1,000.

Given Sony's ownership of Columbia Pictures (and Records), cross-merchandising and licensing deals are very likely. Developers of CD-ROM products have discovered that the copyright logistics for content make development of many categories of product impossible. Products like Warner New Media's Composer Notes discs show how it's possible to add value to existing media, with a significant increase in the selling price. A CD of classical music lists for $14.99, while the Composer Notes discs list for $66.00.

Sony has also created Sony Software Corporation, an electronic publishing group that plans to produce software for all hardware platforms. Since Sony is a major manufacturer of CD-ROM drives for many machines, and since they have the copyright to two large libraries of content, this makes good business sense. It's funny to contemplate, but CD-ROM may finally let a Japanese company become a major supplier of software.

Waiting in the wings is . . . Apple. (If you guessed DVI, you're wrong; that's a technology that still costs too much for inclusion in consumer CD-ROM drives, but it is starting to show up in arcade coin-op machines.) Two or three short news items in trade publications have led to speculation that Apple will produce a consumer CD-ROM machine based on the Macintosh. Since John Sculley has stated that he wants to move Apple into the consumer electronics market, this may be Apple's entry. It requires no new technology, and there is already an installed base of software available.

COMMODORE'S STRATEGY

Commodore has not been just waiting for its competition. They have developed new software drivers for CDTV that give it some impressive real-time video playback capabilities. Dubbed CDXL, the early demonstrations of this have shown HAM mode quarter screen displays running at 15 frames/sec with digitized audio concurrent. Apparently this still leaves some CPU cycles available for other tasks. No new hardware is required for this on the playback end, and no special compression is used for the data on the disc.

In the coming months I plan to discuss CDTV in detail here. I'll cover the products released for it, both software and hardware (the new genlock card and SCSI hard drive card should be interesting). If there are sufficient new products, I may alternate between Amiga and CDTV columns. I'd like to hear from you on what you would like to see covered here. (You can reach me through MicroTimes, on the WELL as mklsf, or through the Internet as mklsf@well.sf.ca.us.) ■

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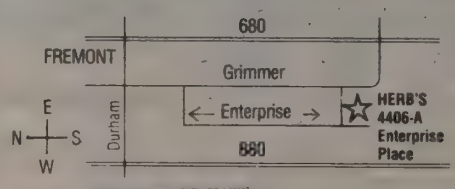

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Continued from page 18

Microcomputer News From Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

➢ The new AT&T Safari computer, which has met with rave reviews in the US press, is being made for AT&T by Matsushita. The lightweight portable comes with many amenities considered necessary for executives on the road.

➢ Lotus plans to offer 1-2-3 built into laptop and palmtop computers in Japan, as it has done in the US. It is combining 1-2-3 with a Japanese word processor and offering it to many portable manufacturers. Japan's portable market is proportionally much larger than the US market.

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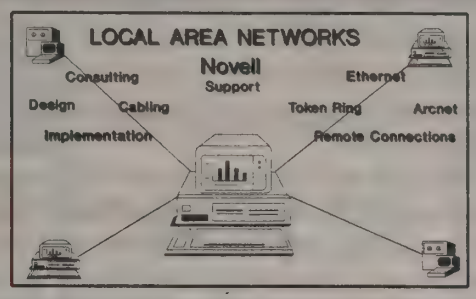

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Continued from page 72

accomplishing. "I'd ask, 'Well, how are MCI and AT&T doing?' They'd say, 'I don't know.' And I'd ask, 'Well, how do you know we're going to be the best if we don't even know what our [industry's] standards are?'"

Esrey knows that as a corporate leader, he must practice what he preaches. Esrey uses on-line databases to stay abreast of external events. "The system goes in once an hour and checks companies in the industry that I want to follow: GTE, MCI, AT&T, and so forth. Now, if there's any news released over the news wire, it immediately shows up on my screen and I can push a few buttons and pick up the story. So anything that's happening in the industry that's significant, I know about it immediately."

Esrey had external information added to the internal financial data to reflect his managers' goals and competitive stance. This helped focus the attention of others on external events: "You couldn't get anywhere without goals. So, on each one of those charts that I can pull up on the system, we added a place for an industry standard and our own goal...with a time frame on it. Now, when you talk to people, they say, "Well, here's the industry standard; here's our goal by December; and here are the programs that are going to allow us to get there.' The system really helped with that process, combined with the discussions. The system reinforced our discussions."

This system worked so well in the early days at Sprint that Esrey is continuing and expanding his efforts in this area: "The culture is starting to change, and people are paying more attention to external information. We're taking the next step to tie this to our quality efforts. We're starting to benchmark. Many people who are involved in the quality process are doing this. Benchmarking is a process of establishing a standard of what the best is. It may not even be in your industry. You find out who is the best in a particular area, such as customer service, and why. Benchmarking involves a detailed analysis of what you're doing, how you're doing, and what you could be doing."

Esrey relies on information systems for guidance in determining the appropriate benchmarks. "To set the benchmarks, I need to be fully aware of how the organization is functioning. Information systems help me to create a firm foundation for knowing why something needs to be done and how to improve results."

PAVING THE WAY FOR MORE CHANGE

Once a general game plan is established, Esrey must help people to focus their efforts on moving toward the goals. Instead of policing their actions, Esrey has adopted a coaching strategy that includes performance feedback loops. Esrey uses the compute to distribute performance information and let people know that he himself is focused on certain measures of performance.

The key word in this profile is "focus." Better information helps Esrey view his business more clearly, and it helps him guide people in the right direction. Esrey said, "Information systems help us track and explain the progress being made on the goals. Ultimately, this focuses people on what's important."

Esrey is able to guide people by communicating, via the information system, why and where change needs to occur. "Once you have [set benchmarks], you're in a position to implement major changes in your culture. You become convinced yourself about where change needs to occur, and the information systems assist you in getting buy-in by helping you share ideas with people. [The tools] help you describe more clearly the standards from other organizations and the measures of your progress in those areas."

EXECUTIVE SUMMARY

Esrey uses information systems to create feedback loops that report on targets and progress toward milestones. As a leadership strategy, he carefully creates information channels to reinforce the kind of managerial behavior he seeks from people in the company.

This approach is far more dynamic than the typical strategic plans, executive speeches, and performance-appraisal systems. The feedback he distributes through the computer continues to enhance Esrey's ability to provide detailed guidance to people at many levels on a daily basis. A high-resolution and dynamic management "control" system enables this corporate leader to rally creativity and energy in a fast-moving business.

By focusing people on what was important, both internally and externally, Esrey brought US Sprint a long way within a very short time. Now a respected competitor in the long-distance market, the company born just a handful of years ago is already moving toward maturity. ■

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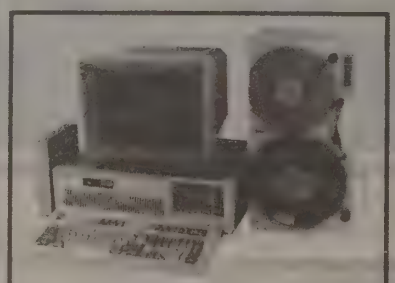

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Continued from page 90

takes some getting used to for a programmer from another language, but it is addictive and very productive.

If KnowledgePro is built around just one data type, Smalltalk has as many as you can imagine. Each object is a member of a class, and classes can be modified to make new ones. Smalltalk is particularly rich in what are called "collection" classes. There is the set, the totally unstructured "bag," the array, the list, the stream, the string, the dictionary. Smalltalk collection types have been so successful that they have been imitated in C++. The freedom to design data types makes the language very powerful. You can design data types that reflect the structure of your problem. Every program becomes a simulation.

Smalltalk programming is an exercise in clear conception, and therefore helps programmers to rethink their conceptions of the process they are encoding.

The goal is to find a programming system that gives you access to all Windows features, automates as many of them as possible, and integrates power and usability.

Smalltalk has always been graphic, with windows, menus, mouse control and on-screen painting. There were classes in earlier, DOS versions of Smalltalk/v which dealt with window management. They were quickly adapted to Windows 3. A similar process allowed the language to be ported to the Macintosh world. It is relatively easy to design and use Windows objects, and they integrate easily into a Smalltalk program.

Smalltalk/v has been realized in DOS, Macintosh, and Windows versions. Much of the code can be used across all the environments. Objects can be stored in text form, and "filed out" and "filed in" from system to system. Because Smalltalk is an interpreter, these objects can be introduced into a running system. The potential exists to network together Smalltalk systems on a number of different platforms, and to let them exchange objects in real time. This is *not* something you can do with C++.

Smalltalk/v has the most thorough tutorial of any of the packages reviewed here. The manual is a complete course in the language, and the example files give you working code for most applications.

Smalltalk is not like other computer languages. Instead of being like a musical score, it is more like a jam session in which you create both new instruments and new musicians as you go along. When you've constructed your band, you're ready to play. Smalltalk is extraordinarily interactive, and the ideal environment for creative people. Accessibility is excellent, limited only by Smalltalk's unusual syntax.

Every element of Smalltalk, from object creation to debugging and running the application, takes place within a single Windows application. Integration is total. The assistance to clear thinking, Smalltalk's clean handling of the Windows environment, its integration and rich data-taxonomy, and its potential for interplatform development, make Smalltalk/v the winner among all the packages we have surveyed. ■

Smalltalk/v Windows
Power: 8
Automation/accessibility: 7
Integration: 9
Total: 24 of 30

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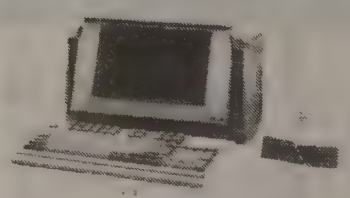

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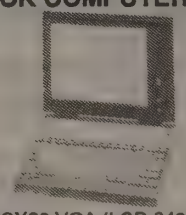

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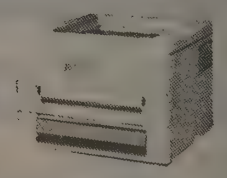

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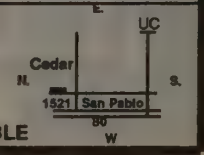

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- 1006V 1:1 MFM 99
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- 1007 SE2 ESDI 155

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PACIFIC DATA see top of next page

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- 9080i 16", 1280x1024, .28 Non-Int 1355

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- 3D 14" Multisync, 1024x768, .28, Int 595
- 3DS 14", 1024x768, Int 595
- 4D 16", 1024x768, .28, Non-Int 995
- 5D 20", 1280x1024, .31 1995
- Plus 14" Multisync, 1024x768, .31, Non-Int 555

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- 1381 14" Super VGA, 1024x768, .28 369

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- Power 2 14" Super VGA, 1024x768, .29 . 305

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- CM2050 20", 1024x768, .31, Non-Int . . . 1650

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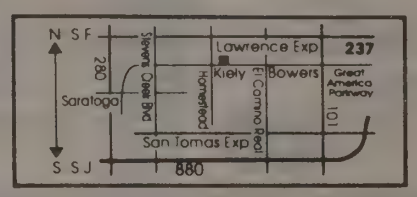

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- Complete Font Library (for HP III, IIID) 255
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- Pacific Page XL (for HP IIP,III,IIID) 715
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  - 4MB 260
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  - 2MB 190
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  - 1.25 MB 299
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- Plotter in a Cartridge P.E. (for HP IID, IIP, III, IIID) 225

17. MOTHERBOARDS

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DTK
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- 386-33 64K cache 805

VLSI
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- 386SX-16 295

MICRONICS
- 386-25 (no cache) BMP-ASIC 575
- 386-25 64K cache BCP-ASIC 775
- 386-33 64K cache ACP-ASIC (2S 1P, IDE adapter on motherboard) 925
- 386-33 64K cache BCP-ASIC 855
- 486-25 64K cache ISA/EISA 1345/2035
- 486-33 64K cache ISA/EISA 1695/2350

MICRONICS ACCESSORIES
- 4MB Piggy Back (to 8MB) 455
- 16MB Memory Card 150
- 32K 2-Way cache 55
- 387 Adaptor 65
- BOIS Award / Phoenix (386) 60/pair
- Keyboard Chip 30

18. MOUSE

APPOINT
- MousePen Pro (portable) $69

LOGITECH
- C-9 Mouse Serial / Bus 59/67
- Catchword 99
- Cordless Mouse 135
- Dexxa serial mouse 29
- Mouseman Serial / Bus 69/75
- Scanman Plus / 256 ..... 139/275
- Trackman Serial / Bus 80/85
- Trackman Portable Serial 99

MICROSOFT
- Ball Point Mouse (new) 119
- Mouse Serial 200PPI 69
- Mouse Serial / Bus 400PPI 89

MOUSE SYSTEMS
- Omni Mouse II 35
- PC Mouse III 69
- PC Mouse III w/ Power Panel 89
- PC Trackball 49
- The White Mouse w/ Power Panel 56

19. NETWORK

3COM
- 3C503 8 bit 199
  - 5 packs (5 boards 1 manual) 799
- 3C503-TP 8 bit / 5 packs 269/1160
- 3C505 16 bit, 256K / 5 packs 579/2620
- 3C507 16 bit / 5 packs 289/1250

ANTISOFT
- Lantastic Ethernet starter kit v3.0 10MBPS 475
- Lantastic Ethernet adapter v3.0 10MBPS .. 225

WESTERN DIGITAL
- Ethercard Plus Elite 8bit / 16 bit 145/185
- Netware Boot Rom 34

CABLES & ACCESSORIES
- RG58 (BNC Male Connectors on each end) Thin Ethernet Cable 10'/25'/50' .. 15/20/30
- RG58-Twist 3
- RG58-Crimp 2.80
- RG58 50 Ohm Terminator 4.50
- BNC "T" Connector F/M/F 4.50

20. POWER SUPPLIES

- 150W / 200W (XT) $45/55
- 200W for Baby AT, AT 55
- 230W (AT) 58
- 220W for Tower 69
- Leadman (UPS) 330W / 500W / 1200W (UPS) 199/399/999
- Dakota PowerSave500 (200W UPS Internal) 129

21. PRINTERS

CANON
- BJ-10e w/ bag (Bubble jet)360 dpi,37K buf $319
  - Auto Sheet Feeder 85
  - Battery 45
  - Print Head Cartridge 22

CITIZEN
- GSX 200 (9 pin) 165
- GSX 140 (24 pin) 285
  - Color Option for above printers 45
  - Auto Sheet Feeder for GSX 140 129
- GSX 145 (24 pin, 132 column) 415
  - Color option for GSX 145 65

EVEREX ABATON
- Postscript Laser (3MB) 1395

FUJITSU
- DL 1100 mono / color 295/345
- DL 4600 5-part form, bar code printing mono / color 995/1129

HEWLETT PACKARD
- Desk Jet 500 489
- Laser Jet IIP w/ toner 795
- Laser Jet III w/ toner 1515
- Laser Jet IIID w/ toner 2495
- Laser Jet IIIP w/ toner 1075
- Accessories:
  - Envelope Cassette (15 envelopes) 69
  - Envelope Feeder for IIID 295
  - HP Postscript Cartridge 495
  - Legal Tray for HP II & III 69
  - Lower Cassette for IIP 160
  - Paper Tray for IIP 69
  - Toner for HP II / IIP/ III 85/75/85

PANASONIC
- 1180 165
- 1123 / 1624 ..... 249/385
  - 32K Buffer for above printers 65
  - Serial interface card 65
- 4420 Laser 829
  - 1MB Memory Card 199
  - Developer KX-PDP2 95
  - Drum KX-PDM2 99
  - Envelope Tray KX-P431 59
  - Fonts Card 95
  - Legal Tray KX-P425 45
  - Toner KX-P451 39
- 4450i Laser 1175
  - 1MB Memory Card 199
  - Developer KX-PDP1 95
  - Drum KX-PDM1 145
  - Envelope Tray KX-P430 59
  - Fonts Card 95
  - Legal Tray KX-P420 45
  - Toner KX-P450 35
- 4455 (Postscript) ..... 1975 same as 4450i

QMS
- QMS-PS 410 4ppm, 2MB, 45 Fonts 1895
  - 1MB / 2MB / 4MB Memory ...129/179/269
  - Envelope Tray 69
  - Legal / Letter Tray 69
  - Lower Paper Cassette 160
  - Toner 95
- QMS-PS 810 8ppm, 2MB 2735
- QMS-PS 2210 / 2220 ..... call
- ColorScript 100-10 4MB, 35 Fonts 6595
- ColorScript 100-30i ..... call

SEIKO
- Smart label Printer (IBM/APPLE) 175

PELICAN
- All type ribbons ..... visit us
- Toner for Laser Printers ..... visit us

MEMORY for Laser Printers
Apple, Canon, Epson, HP, IBM, Konica, Okidadta Panasonic, QMS, Texas Instruments ..... call

22. SCANNERS

DEST Personal Scan hand held & automatic document feed capabilities in one desktop unit, 64 level of halftone gray, w/ Reconize! and Image-in software ..795

MICROTEK MSF-300Z flatbed 16.8 mil colors, 256 shades of gray w/ Photostyler (image processor) .. 1695

PLUSTEK ScanPlus sheet-fed, comes with Calera Wordscan & Picture Publisher Plus
- 8 bit output gray 695
- 16.8 mil colors, 8 bit output gray 895

Hand scanners .... see Logitech in section #18

23. SOFTWARE

ADOBE
- Complete Type Library ..... call
- Illustrator for Mac / Windows 3.0 .....335/285
- Plus Pack for Mac / Windows 3.0 119
- Photoshop for Mac 555
- Postscript Cartridge for HP II 299
- Streamline for Windows 3.0 225
- Type Align for Windows 3.0 59
- Type Cartridge 1: Display Faces 215
- Type Cartridge 2: Best Sellers 235
- Type Manager for Mac / Windows 3.0 59
- Type Set 1/2/3 for Mac / Win 3.0 .. 75/75/105

MICROSOFT
- DOS 3.3 / 4.01 65
- DOS 5.0 (new) 65
- DOS 4.01 w/ Windows 3.0 130
- Entertainment Pack for Windows 3.0 35
- Excel for Windows 3.0 299
- Flight Simulator 39
  - Maxx Control Yoke 57
  - Maxx Pedals (IBM) 39
  - Maxx Instrument Flight Training 66
- Learning DOS 35
- Microsoft C 6.0 309
- Mouse w/ Paintbrush 99
- Mouse w/ Windows 3.0 157
- Office 1.6(Excel, Word, Power Point, Mail) 455
- OS/2 Presentation Manager Tool Kit 1.21 . 309
- PC Mail Server for DOS & Windows 435
- Power Point for Windows 289
- Productivity Pack for Windows 38
- Project Management 4.0 309
- Project for Windows 1.0 429
- Quick Basic 4.5 62
- Quick C Compiler w/ Quick Assembler ... 125
- Software Development Kit 3.0 309
- Windows 3.0 69
- Word 5.5 207
- Word for Windows 3.0 299
- Works 2.0 99
- Works w/ Mouse 2.0 159

MICROSOFT FOR MACINTOSH
- Mail Server 3.0 259
- Excel 3.0 299
- Office (Word, Excel, Powerpoint, Mail) 529
- Powerpoint 2.01 259
- Word 4.0 / Works 2.0 .....255/199

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- DataPerfect / DrawPerfect 265/255
- LetterPerfect / PlanPerfect 125/235
- WordPerfect 5.1 for DOS 239
- WordPerfect 2.0 for Mac 239
- WordPerfect Executive / Office 145/95

OTHERS
- After Dark (screen saver) 35
- Ashton-tate Multimate 4.0 249
- Atech Publisher's Powerpak 39
- Borland Object Vision for Windows 99
  - C++ Profession for Windows 299
  - Turbo C++ (Dos Version) 95
  - Turbo Pascal for Windwos 159
  - Turbo Pascal Professional 6.0 199
- Central Point Backup 6.0 65
- Corel Draw 2.0 349
- Davidson Education Algebra/ Read/ SAT/ Spelling . 30 & under
- DR DOS 5.0 upgrade (for users w/ any DOS) 75
- Fastback Plus 112
- Geoworks Ensemble 129
- Grammatik IV 2.0 57
- Grammatik IV for Windows 57
- HP New Wave 3.0 109
- Hardvard Graphics 3.0 395
- Individual (Learning Software) .... 39 & under
- Labels Unlimited 3.0 57
- LapLink Rel 3 95
- Lotus 1-2-3 Rel 3.1 379
- MacPrint 85
- More Fonts 85
- Norton Commander 3.0 89
- Norton Utility 5.0 115
- PC Tools 6.0 89
- PFS: First Choice (w/ Prodigy start-up kit) .. 85
- Pacioli 2000 24
- PageMaker for Windows 4.0 479
- Personal Lawyer/ Lifestyles 55
- Pro-scan (virus identifier & remover) 55
- Quarterdeck DesqView 286/386 v2.3 . 79/125
  - Expanded Memory Manager 386 v5.1 . 64
  - Manifest 45
  - Qram 45
- Quicken for IBM/Mac 39
- Readright 2.01 305
- Software Source (Public Domain) 3
- Sound Blaster 145
  - CMS Chip / Speaker 29
  - MIDI kit 59
- Ventura Publisher Gold for Windows 509
- Wordstar 6.0 175
- XTree Gold 2.0 99

24. TAPE BACKUP

AT & T
- 40MB $185

COLORADO
- DJ-10 (40,60,120MB) 255
- DJ-20 (250MB) 345
- AB-10 Controller for DJ-10 75
- FC-10 Controller for DJ-20 95
- CK-17 Cable 20
- KE-10 Ext Hardware kit for PC, XT, AT 119

EVEREX (with software, cassette/cartridge)
- 60MB (DC600A)/ Ext 645/765
- 250MB (DC6250)/ Ext 757/865
- 60MB-PS/2 (DC600A)/ Ext 765/875
- 250MB-PS/2 (DC6250)/ Ext 875/995
- 60MB AT Floppy w/o media 225
- 60MB AT Floppy Ext w/ power 395
- 40MB PS/2 Floppy (50,60,70,80) (DC2000) w/o media 265
- All sizes of cassette ..... visit us

25. VGA CARDS

All VGA cards come 1024x768 except as stated

ATI
- Wonder Plus w/ mouse 512K/1MB .. $219/239
- ATI chipset 256K/512K 115/135

EVEREX
- EGA Card 59
- Viewpoint Standard (800x600) 75
- Viewpoint 256K/512K 135/155
- VRAM (1MB DRAM) 235

GENOA
- 6300 256K/ 6400 512K 105/125
- 6400A 512K 199

HERCULES
- Graphics Station 1MB 650
  - upgrade 2MB 335

ORCHID Prodesigner II 1MB 265/245

PARADISE
- 8514/A Plus 449
  - 512K memory upgrade 205
- Plus 256K/512K 135/155
- Paradise chipset 256K/512K 85/105

PHOTON
- Ultima Turbo (1280x820, 1024x1024) 335

VIDEO SEVEN
- 1024i 256K/512K 185/205
- SPEA 1280 (1280x1024) 1895
- VRAM 512K 365
- VRAM II 512K 365
  - upgrade to 1MB 165

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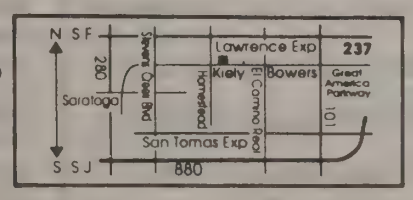

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RESOURCES

Calendar Of Events

JUNE

June 11 Omnipage/Typist Seminar. Sunnyvale. M & P Computer. Call: (408)738-8578.

June 11–12 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

June 11 & 18 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

June 12 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 12 System 7 Demonstration. Fremont. SPC Apple. Call: (415)881-9160.

June 13 Word For Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 13–14 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

June 14 Acius Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

June 14 MS Excel Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 15 Computer Show & Sale. Cow Palace. Computer Swap. Call: 1-800-533-7220.

JUNE 15

FUJITSU CLASSIC RUN FOR THE KIDS

SAN JOSE

Ronnie Lott, All-Pro defensive back for the San Francisco 49ers, will be the official starter of the Fujitsu Classic Run on June 15, at 8:30 am. Hosted by Fujitsu Microelectronics, Inc. and sponsored by several Silicon Valley businesses, the "Run for the Kids" celebrates its fourth year. This 8k run and 2mi. walk will raise funds to benefit Children's Home Society of California, Children's Shelter of Santa Clara, and Children's Discovery Museum of San Jose. For additional race information, call: (408)922-9000.

June 15 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

June 15 & 22 HyperCard Scripting Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

June 16 Computer Show & Sale. Sacramento. MarketPro. Call: (415)388-8893.

June 17 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 17 & 24 FileMaker Pro Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

June 18 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 19 User Interface And Artistic Values: Presentation By Andy Hertzfeld. Palo Alto. SEF. Call: Barbara Cass, (415)854-7219.

June 19–22 MacHack '91: The Sixth Annual Macintosh Technical Conference. Ann Arbor. ExpoTech. Call: (313)882-1824. AppleLink: Expotech.

June 20 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

June 20 Advanced System Administration: Maintaining And Troubleshooting A Novell Network Seminar. Oakland. DATAssociates. Call: Virginia Sykes, 1-800-444-NOVL.

June 21 & 28 MacroMind Director Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

June 22 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

June 22 Computer Show & Sale. San Mateo County Expo Center. Computer Swap. Call: 1-800-533-7220.

June 23 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

June 23 Computer Show & Sale. Santa Rosa. MarketPro. Call: (415)388-8893.

June 23–25 Structuring Business Partnerships For Competitive Advantage Conference. Laguna Niguel. AMR International. Call: 1-800-743-9191.

June 26 Scanner Orientation Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

June 27 System Administration: Managing A Novell Network Seminar. Oakland. DATAssociates. Call: Virginia Sykes, 1-800-444-NOVL.

COMPUTERS AND TECHNOLOGY: COURSES FOR THE ACCOUNTING PROFESSIONAL

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The eight-course Microcomputer Consulting Curriculum presents a comprehensive curriculum covering strategic, technical, and marketing issues to help accounting professionals in this rapidly growing field. Topics discussed in these courses include: Profitability Through Microcomputer Consulting, Accounting Software, Defining Your Services and Understanding Your Client, Local Area Networks and Multiuser Systems, and Spreadsheet Applications. After completing all eight courses you will receive a Certificate of Educational Achievement. Contact, Society of California CPAs, Educational Division, CPE Services, 275 Shoreline Dr., Redwood City, CA 94065. (415)594-9393.

June 28 Intro To Microsoft Works Database Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

June 29 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

June 30 Computer Show & Sale. Hayward. MarketPro. Call: (415)388-8893.

JULY

July 2 Do You Need Windows 3.0? Workshop. San Francisco. The Software Training Group. Call: (415)397-4158.

July 5 Network Administration Seminar.

continued

MOUNTAIN VIEW
67 E. Evelyn Ave. #100
415/968-3466
M-F 9:30-6:30 SAT Closed

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415/256-8828
M-F 10-7 SAT. 11-5

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386sx 16MHz .....Baby Desktop..	$649
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All Systems include: 1 MB RAM,1.2 MB or 1.44 MB floppy drive,1:1 interleave controller,2 serial,1 parallel port, 101 Keys enhanced keyboard, Clock & Calendar w/battery backup.

Two Year parts&labor warranty.

30 **Days Compatibility Money Back Guarantee**

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SLK Systems

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14" color VGA, 1.2MB
1MB RAM, 40MB HD
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Also Included
Three Button Mouse

EVEREX

Tempo NoteBook -7 lbs

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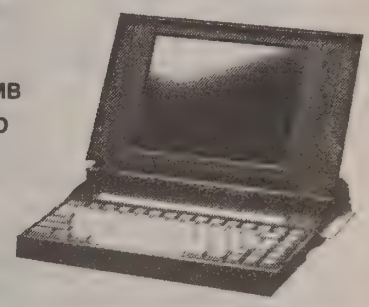
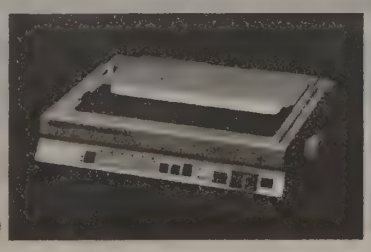
386sx-16MHz VGA..
21MB HD, 1MB to 5MB
DOS 4.01, 1.44MB FD

$2,995
386sx-20MHz VGA
w/ 60MB HD
Dos 4.01, 1.44MB FD

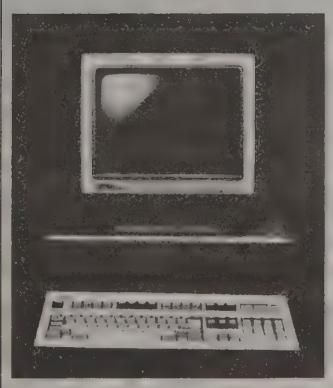


Panasonic Office Automation OA



9 Pins
KX-P1180192cps$169
24 Pins
KX-P1124.192cps$279
KX-P1123.192cps.$259

SLK Systems



°486 25MHz W 64KB Cache	$1599
°386 33MHzW/64KB Cache...	$999
°386 25MHz -	$799
°386sx16MHz	$599
°286 12MHz .	$399

Systems include: 1 MB RAM,1.2 MB or 1.44 MB floppy drive,IDE controller,2 serial,1 parallel port, 101 Keys enhanced keyboard, Clock & Calendar w/battery backup.

***One* Year parts & labor warranty.**

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PORTABLE 386-25MHz
LV-25386 w/100MB HD

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100MHD
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1.44 MB FD
2S,1P Ports, Carrying Case, 640x480 VGA Card, IDE HD/FD Controller, 1MB RAM (Exp to 8 MB)

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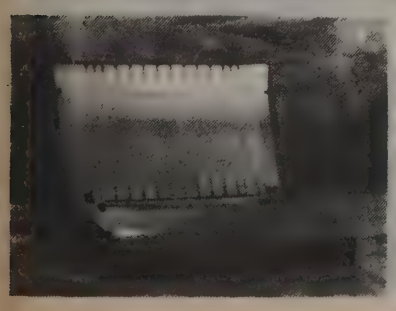
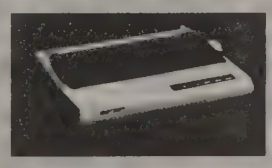


5 lbs, 83 cps,
360x360 dpi
Optional
rechargeable
battery

$329

star THE COMPUTER PRINTER



9 Pins
NX-1001.....180cps..5.fonts..$149
NX-1020R.Color..225cps..6.fonts.$195
NX-1500.Wide.....180cps..4.fonts.$295

24 Pins
NX-2415.Wide.....200cps.4.fonts.$345
NX-2420.....250cps.7.fonts.$295
NX-2420R.Color...250cps.7.fonts.$325

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1MB RAM,4PPM ,300x300 dpi HP LaserJET IIP/FX-850 Emulation Parallel & Serial Interface Use same Toner cartridge for HP

The DL1100 From

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*ColorIT Model makes color affordable
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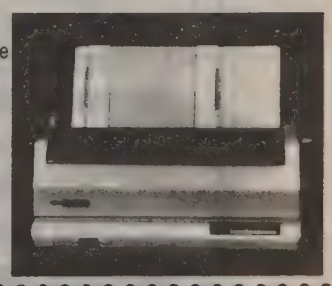
*5 Resident LQ Fonts, 4 Emulations
*Two year warranty
*Free Appreciation Pack



$359

DL3400 ***$369***

24 wire 240 cps(10cpi)288 cps(12 cpi), 136 column printer. Emulates IBM Graphics, IBM Proprinter XL, Diablo 630, Epson FX-80. **Includes:** centronic interface, bi-directional push tractor and paper parking.

Calendar Of Events continued

San Francisco. Abacus Training. Call: (415)759-9508.

July 6 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 7–10 Joint Meeting Of National Datapoint And International Databus User Groups. Orlando, FL. Call: 1-800-334-9968, ext. 7960.

July 9–10 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

July 11–12 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

July 13 Computer Show & Sale. San Mateo County Expo Center. Computer Swap. Call: 1-800-533-7220.

July 13 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 16 & 23 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

July 18 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

July 18 Adobe Illustrator For Beginners Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

July 20 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

JUNE 19

PARADOX WORLD TOUR 1991

Hyatt Regency San Francisco

Borland International has announced Paradox World Tour 1991, a complete day of training and helpful hints to let you get the most out of Paradox 3.5 in your business environment. The keynote address will be about how Borland's applications and languages can be integrated into complete industry solutions, computing trends for the '90s, and demonstrations of Borland products. The sessions are divided into two tracks: Power Users and PAL Developers. Participants will receive free their choice of: Paradox 3.5, Paradox Engine, Paradox SQL Link, or ObjectVision. Paradox World Tour, CT Meeting Planners, Inc., 731 Main St., Suite C-3, Monroe, CT 06468. 1-800-452-5388.

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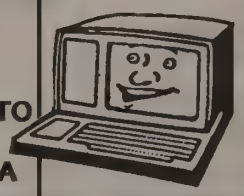
Sun. June 9 - SAN RAFAEL
Holiday Inn-Terra Linda
Sun. June 16 - SACRAMENTO
Scottish Rite Temple
Sun. June 23 - SANTA ROSA
Sonoma County Fairgrounds
Sun. June 30 - HAYWARD
Centennial Hall
Sat. July 6 - UNION CITY
Holiday Inn



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Membership entitles you to FREE Adm. for 1 or 2 yrs. to over 80 shows a yr, in CA.

DON'T MISS OUT! Additional Specials At The Shows For Club Members From Participating Vendors. (Specials vary from show to show)

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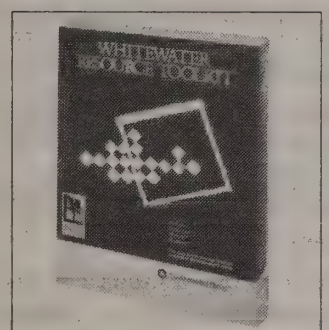

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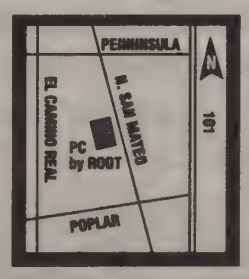

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July 21 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

July 22–25 Microelectronic System Education Conference & Expo. San Jose. Conference Management Services. Call: (415)329-0510.

July 23–25 Mactivity '91: The Macintosh Connectivity Conference. Santa Clara. Winehouse Computer Co. Call: (408)354-2500.

July 25 Quark Xpress I Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

July 27 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 29–31 Imaging Solutions For Business Conference. San Francisco. Digital Consulting, Inc. Call: (508)470-3880. Priority code: 1LTAXX.

July 30 MacDraw: Basics And Beyond Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

AUGUST

August 4–8 The International Conference On APL. Stanford University. ACM & SIGAPL. Call: (415)326-7781.

August 10 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 12–14 Intro To C++ For C Programmers Course. Techmart. UC Extension. Call: (408)427-6636.

August 13 & 20 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 15 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

August 15–16 Object-Oriented Design And Programming In C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 17 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 18 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

August 19–21 C++ Programming For The Macintosh Course. Techmart. UC Extension. Call: (408)427-6636.

August 19–23 SCO Forum91: The International SCO Technology And Marketing Conference. Santa Cruz. SCO. Call: 1-800-553-9939.

August 22 Quark Xpress I Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 22–23 MacApp Programming Using C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 23 Intro To Microsoft Works Database Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 24 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 28 Scanner Orientation Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 29 Quark Xpress II Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

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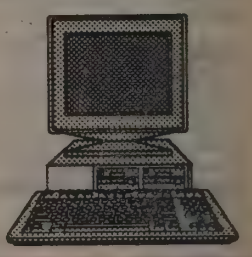

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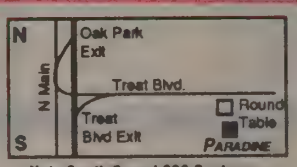

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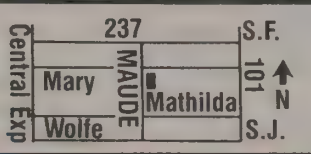

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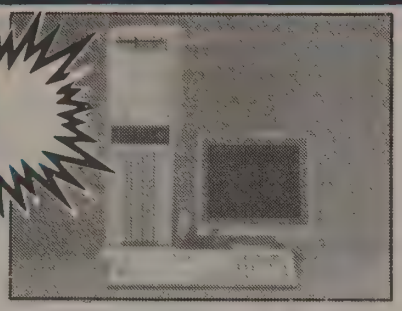

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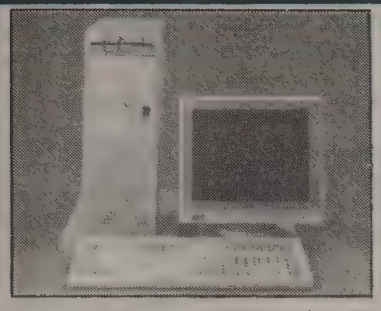

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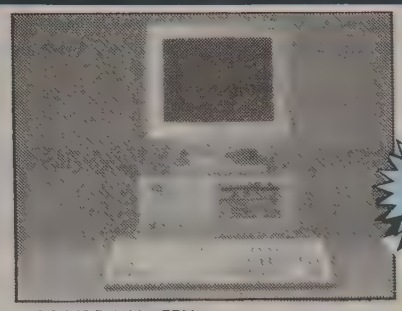

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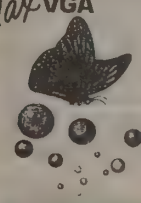

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Telenaut BBS. (415)454-2313. 8-N-1, 24 hrs., 2400. Home of Telenaut Cartoons & Telenaut Cafe (Computer Arts' Floating Exhibition) featuring original art from all over the world. Sysop: David Newman. [Exp. #83.]

Uncle "D" Directory. (415)364-3001. 8-N-1, 24 hrs., 1200/2400. Software for educational purposes and the deaf, mail msgs. [Exp. #83.]

VA Listings. (415)744-7793. 24 hrs., 300/1200/2400. Multiline, VA-owned homes for sale. Sysop: David Piersall. [Exp. #85.]

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Wetware Diversions. (415)864-3874. 8-N-1, 24 hrs., 1200/2400. Multi-line, PC Pursuitable, San Francisco's Public Access UNIX System. (cc@wet.UUCP) Sysop: Christopher Cilley. [Exp. #83.]

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PROFESSIONAL ASSOCIATIONS

Artificial Intelligence Association. Individuals interested in learning about the use and application of AI. Call: Rita Zokaei, (415)574-8225. [Exp. #83.]

Association For Women In Computing. Meetings: 1st Wed., 5:30 pm, San Francisco Marriott. Call: (415)979-8450. [Exp. #86.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, room 608-7. Call: Judy Stern, (415)643-7499. [Exp. #84.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #84.]

Independent Computer Consultants Association. Meetings: 2nd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #83.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:15 pm, San Rafael. Call: Harry Chapman, (415)291-0174. [Exp. #87.]

Society For Technical Communications, East Bay Chapter. Meetings: 1st Thurs. Call: Corinne Stefanick, (415)769-8931. [Exp. #88.]

Society For Technical Communications, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #88.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #88.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #83.]

The Association For Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #88.]

United Sysops Association. Meetings: 2nd Wed, 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (408)453-3321. [Exp. #84.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #85.]

Writer's On-line Association Of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #86.]

USER GROUPS

ACCOUNTING

Champion Accounting Systems User Group. Fremont. Newsletter, BBS, ideas, and help. Call: Garhart, (415)657-5880. [Exp. #84.]

AMIGA

AAA (Amiga Addicts Anonymous). Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (415)935-0829. [Exp. #88.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (415)826-6053. [Exp. #88.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #85.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary. Call: (415)584-8406. [Exp. #87.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:00 pm, Palo Alto Hyatt. Call: Mike Fisher, (415)855-9426, BBS (415)595-2679. [Exp. #84.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm. Variable. Call: Tibor Horvath, (415)283-5611. [Exp. #86.]

APPLE

San Francisco Apple Core. Meetings: 3rd Tues., 7:00 pm, SF State University, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #84.]

APRICOT

Apricot User Group, East Bay Chapter. New members welcome. Call: Ron, (415)828-9643. [Exp. #85.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #84.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #84.]

AT&T Computer Users Group. Meetings: 2nd Wed., 6:30 pm. Refreshments, technical support and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #84.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #84.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. Call: (415)469-7924. [Exp. #88.]

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #86.]

COAST User Group. Meetings: 3rd Wed., 1514 University Ave., Berkeley. Specializing in DTP, CAD, and serious use. Call: Bill Yerger, (415)548-8999, BBS (415)845-1789. [Exp. #85.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Public Library. Atari Club, 8/16/32-bit. Call: Keith Sammons, (415)887-2008. [Exp. #84.]

Santa Clara County Atari Users Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computer Showroom, 1278 Alma Court. Formerly South County Atari Users Group. Call: Ron Reade, (408)225-7162, BBS (408)848-6032. [Exp. #88.]

CAD/CAM

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #84.]

Marin ACAD User Group. Meetings: 1st. Thurs. Call: Gigi Bollinger-Himes, (415)491-4722. [Exp. #84.]

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #84.]

Textile Computer Users Group—TCUG. Meetings: Bimonthly, 1st Sun., 10:00–noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #84.]

COMMODORE

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (415)793-2514. [Exp. #87.]

Cupertino Chapter Of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #85.]

CWEST Commodore 64/128. Meetings: 3rd. Wed., 7:00 pm, Fort Mason. For info: 1564 Waller #B, San Francisco, 94117. Call: (415)626-9946. BBS, (415)626-9946. [Exp. #87.]

North Valley Chapter Of 64/More Commodore User Group. Meetings: 2nd Sat, 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #85.]

COMMUNICATION

Toastmaster International. Meetings: Every Wed., 6:00 pm, Laguna Honda Hospital, San Francisco. Improve your communication and presentation skills. Call: Maurine Martin, (415)882-7335 or (415)759-0634. [Exp. #84.]

dBASE

dBASE IV SIG. Meetings: 1st Tues., Ashton-Tate, 6411 Guadalupe Mines Rd., San Jose. SIG of the Silicon Valley dBase Language Group. Call: Charles King, (408)724-7024. [Exp. #84.]

dBASE SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 333 California St., San Francisco. Call: Mark Webster, (415)647-3675. [Exp. #83.]

East Bay Database User Group. Guest speakers. Call: David Chilcott, (415)653-1303, BBS (415)652-1763. [Exp. #85.]

SQL-Forum. Meetings: 1st Thurs., 6:30 pm, 394 Pacific Ave., San Francisco. Topics include client/server computing & SQL database servers. Speakers, demos. Call: (415)695-2748. [Exp. #83.]

SVDLG dBASE SIG. Meetings: 1st Tues., 6:30 pm, ASI, ABSI Birchwood Systems, Suite 480 W., 2001 Gateway Place, San Jose. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

SVDLG FoxPro SIG. Meetings: 2nd Thurs., 6:30 pm, ASI, ABSI Birchwood Systems, Suite 480 W., 2001 Gateway Place, San Jose. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

DESKTOP PUBLISHING

Bay Area DTP User Group. Meetings: 1st Tues., 7:00 pm, Nisha Software, 2493 Telegraph Ave., Berkeley. Call: Dr. C.J. Wallia, (415)848-8200 or 548-7712. [Exp. #88.]

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:00 pm, 660 Market St., Ste. 215, San Francisco. Call: Eric Leong, (415)635-0159. [Exp. #83.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #86.]

FOURTH

Fourth Interest Group Of North Bay. Meetings: 2nd Sat., 1-5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #87.]

Fourth Interest Group Of San Francisco. Meetings: 1st & 3rd Tues., 6:00 pm. Walk to dinner. Call: John Peters, (415)239-5395. [Exp. #87.]

IBM AND COMPATIBLES

Desktop Video SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: Mike Shurtz, (415)522-1797. [Exp. #83.]

DESQView SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Visitors $3. Call: Adam Baum, (415)841-5628. [Exp. #83.]

EastBay FOG. Meetings: 2nd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #87.]

GeoWorks SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: Larry Yurdin, (415)527-2647. [Exp. #83.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 7:30 pm, San Rafael Community Center. Call: (415)927-2909. BBS (415)927-1216. [Exp. #83.]

Investments SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: George Montgomery, (707)795-5673. [Exp. #83.]

Napa Valley PC User Group. Meetings: 2nd Wed., 7:30 pm, 10 Chapel Hill Dr., Napa. Call: Lee Schwab, (707)257-2675. [Exp. #85.]

PC Clubhouse. Meetings: 1st Fri., 8:00 pm, Meiklejohn Hall, CSU Hayward. Many SIGs. CV BBS: (415)581-8529. San Leandro BBS: (415)357-9577. Call: Roberta, (415)429-1007. [Exp. #87.]

PCjr SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: John King, (415)472-7035. [Exp. #83.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338, ext. 444. [Exp. #88.]

San Lorenzo User Group. Meetings: 2nd Tues. and the 20th, 7:00 pm, Gathering Place in Ben Loman, Santa Cruz County. Call: Chuck Schafer, (408)338-7348, BBS (408)335-4672. [Exp. # 86.]

WordPerfect SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Visitors $3. Call: Kendall Callas, (415)821-1310. [Exp. #83.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm. JNZ, Inc., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (415)947-4878, BBS (415)935-4878. [Exp. #88.]

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C6392	I.R. Receiver Kit	$13.25	C6393	I.R. Transmitter Kit	$9.25
C6395	Car Fluid Level Kit	$16.95	C6442	20W+20W Stereo Amp	$20.95
C6446	Color Organ Kit	$9.95	C6447	Geiger Counter Kit	$39.95

...and still more Kits!

...such as these more advanced kits (Warning! Not for Beginners!):

C6278	Nicad Zapper Kit	$19.95	AA-7	Active Antenna Kit	$24.95
AR-1	Aircraft Band Receiver	$24.95	CW-7	CMOS CW Keyer Kit	$24.95
FM-10	FM Stereo Transmitter	$29.95	FM-2	FM Wireless Mike/Preamp	$7.95
FM-3	FM Mini Wireless Mike	$16.95	FM-4	Hi Pwr FM Wireless Mike	$12.95
FR-146	2 Meter FM Ham Receiver	$29.95	FR-220	1 1/4 Meter FM Receiver	$29.95
HR-20	20 Meter Ham Receiver	$27.95	HR-30	30 Meter Ham Receiver	$27.95
HR-40	40 Meter Ham Receiver	$27.95	HR-80	80 Meter Ham Receiver	$27.95

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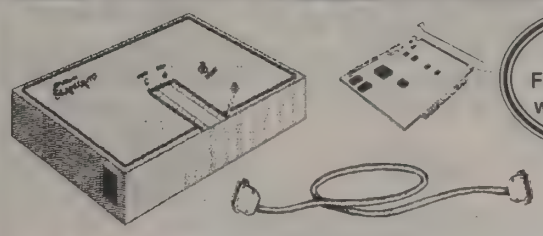

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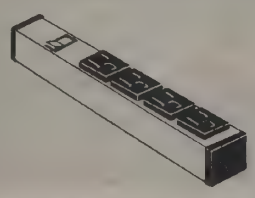
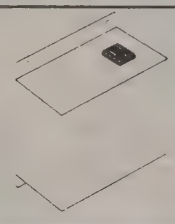


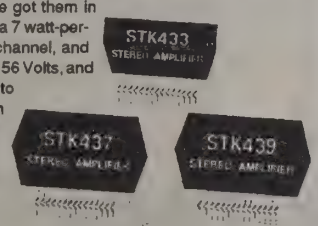
When you are setting up computers or other types of electronic systems such as test equipment or stereo gear, you inevitably need more AC Outlets. In addition, sensitive equipment often needs to be isolated from "hash" that can come in over the power lines. These products can help you solve your AC problems. We are offering two high-quality industrial AC Outlet strips (similar to illustration at left), that stand head and shoulders above the ordinary variety found in most hardware stores and computer shops. The sturdy extruded aluminum housings feature either 7 or 8 outlets and have circuit breakers rated at 15 Amps. The 7-outlet model has a 16 foot cord and a switch, the 8-outlet model has a 6-foot cord and no switch. The 15 Amp EMI Filter shown at right is an industrial unit that has a 2-foot AC cord (not shown) and a single outlet. It filters annoying high-frequency noise from the AC Line. Can you afford to be without its protection?

7-outlet strip HSC #12272 $9.95 8-outlet strip HSC #12342 $8.95 AC Line Filter HSC #12343 $14.95



Stereo Amplifier Modules

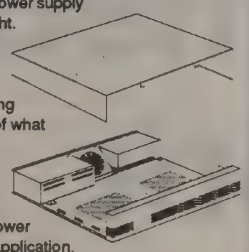
These Stereo Amplifier Modules by Sanyo are the easiest way there is to amplify an audio signal...no wonder they are used in so many consumer stereo products! We got these as surplus inventory from a major stereo equipment manufacturer, and we got them in quantities that let us price them right! The STK-433 is a 7 watt-per-channel item, the STK-437 is rated at 10 watts per channel, and STK-439 is a 15 watt-per-channel item. The Vcc max is 56 Volts, and it would appear that they need to be properly attached to a good sized heatsink. We do provide a pin connection diagram and application sheet containing schematics with each one so you can get amplifying right away!



STK-433	HSC #12206	$3.95
STK-437	HSC #12123	$6.95
STK-439	HSC #12124	$6.95

Low Profile Drive Enclosures

The model shown is the perfect set-up for one or two 3 1/2" hard drives. It is brand-new and measures 13 1/2" wide by 2 1/4" high and 14 1/2" deep. It features a built-in power supply (roughly 30 watts) and an angled 12 VDC fan that allows a low height. 5 1/4" drives would physically fit, but you may have to fabricate some brackets for that application, and the power supply may not be enough for two drives. Once you remove the custom PC board and make a different connector for the fan, simply bolt in your drives, hang a cable out the back and you have a tidy installation for a fraction of what you would expect to pay! Shipping weight is approximately 12 lbs. Also available, but not shown, is a brand-new empty case (no power supply or fan) that measures 7 1/2" x 2 3/4" x 14". These will accept one half-height drive, floppy or hard (5 1/4" direct, or 3 1/2" with appropriate brackets and bezel) and leave room for a small power supply, although the rear panel may need to be reworked for your application. They are light beige in color, and shipping weight is approx. 4 lbs.



Single Drive Case, no power supply HSC #12031 $19.95
Dual Drive Case with power supply HSC #12173 $29.00

High Quality Video in Hurry!

Building a system and need a quick and inexpensive video card? Try one of these brand-new-in-the-box Everex Evergraphics Plus Monochrome adapters...American Name-brand quality at a no-name import price! Hercules Mono and Xenix compatible, 80 x 25 character text mode is expandable to 132 col. by 44 Rows, as well as 720 x 348 pixel-adressable graphics. Plus, it has a parallel printer port! All these features for just $17.50! HSC #12341

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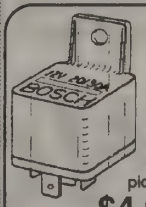
Is your AT Losing its Memory?

If your AT is acting strangely, it could be that its battery is weak! The inte that supplies power to the CMOS RAM typically has a life of one tc years...so it is easy to forget it is there. Then when it dies, you wonde why your computer can't find its hard drives, or the internal clock, or the extended memory. The answer is as simple as removing the cover, unplugging the old battery and installing the new one. These 4.5 Volt Alkaline Ray-o-Vac Computer Clock Batteries are 1" x 3/4" x 2 1/4" in size and brand new in blister packs. HSC #12340 **$3.95**

High Current 12VDC SPDT Relay



If you have a European automobile, you probably recognize this relay...it is used in everything from BMW's to Mercedes to Maseratis! These high-reliability Bosch items are just the ticket for those high-current DC switching problems...20 Amp contacts inside a one inch cube! The contacts are standard 1/4" spade lugs, and there is a handy mounting tab on the back edge. The coil resistance is approximately 90 ohms. See what your BMW dealer gets for these items, then, when you have picked yourself up off the floor, compare that against our price of $4.95! HSC #11424

$4.95

DC to DC Converters - Perfect for Op Amps!

These tiny DC - DC Converters are perfect for those projects where you need a little bit of +12VDC or -12VDC, like op amps or older EPROMS. Made by Elpac/TDK, these PC Mount packages are only .5 x .5 x 1.25" and accept from 3 to 7VDC for input. They put out 12VDC at 25 mA. Get several of each for your bench stock!

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MACINTOSH

MacSEF. Meetings: 3rd Tues., 7:00 pm, Call: Tony Meadow, (415)644-9400. [Exp. #84.]

North Coast Mac Users Group. Meetings: 3rd Thurs., 7:30 pm. Lark 2004, Santa Rosa Jr. College. SIGs on development, programming, and multimedia authoring, networking, graphics, and more. Call: Reed Hopkins, (707)542-1089, BBS (707)792-1871. [Exp. #85.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to **Apple** Computers User Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #88.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #88.]

MULTIMEDIA

Macromind Multimedia User Group And Video SIG. For more information, call: (415)442-6200. [Exp. #83.]

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #88.]

MUSIC

Computer Music SIG. MIDI and beyond. All computer types welcome. Call: Bob Brander, (415)592-6993. [Exp. #86.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #87.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #88.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. [Exp. #87.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)453-3321. BBA (408)453-3326. [Exp. #86.]

The East Bay Novell Users Group. Call: George M. Gold, (415)444-4899. [Exp. #86.]

The San Francisco Novell Users Group. Call: Thomas Thibault, (415)944-9500. [Exp. #86.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers at all levels. Call: Robert Smiley, (415)957-4656. [Exp. #87.]

Paradox SIG/SFPCUG. Meetings: 3rd Mon., 6:15, UCSF, 333 California St., San Francisco. Call: Richard Haven, (415)566-8076. [Exp. #83.]

PROGRAMMING LANGUAGES

SVDLG C SIG. Meetings: 3rd Mon., 7:00 pm, Techmart, Santa Clara. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

RACES

California Races Group. Meetings: Tues., 7:00 pm, 1491 River Park Dr., Sacramento. Technical discussions on computerized emergency communications. Call: Jim West, (916)991-5505. [Exp. #87.]

R:BASE

R:Base Users Group Of Oakland. Meetings: 2nd Thurs., 9:00 am. Call: Longwell Assoc., (415)451-5316. [Exp. #87.]

UNIX/XENIX

UNIX SIG. Meetings: 2nd Tues., Oracle Corp. Fitness Center, Redwood Shores. Sponsored by Software Entrepreneurs Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #85.]

UNIX SIG/SFPCUG. Meetings: Last Wed., 7:30 pm, Call: John Tait, (415)386-9230. [Exp. #83.]

UNIX/XENIX User Group Of N. CA. Meetings: Call: Ren Just, (707)664-0820 or BBS (707)795-1721. [Exp. #83.]

WINDOWS

Windows 3 & Applications SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 333 California St., San Francisco. Call: Ron Person, (707)539-1525. [Exp. #83.]

WORDPERFECT

South Bay WordPerfect User Group. Meetings: Saratoga Community Library. Dates vary, free. Call: Martin Van Derpool. (408)238-8434. [Exp. #85.]

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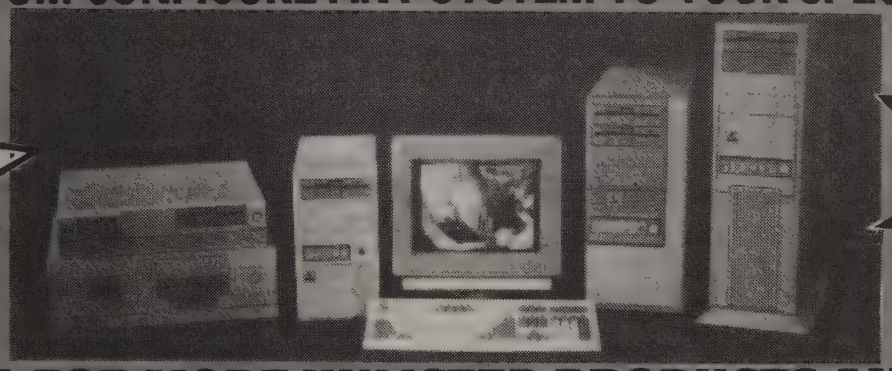

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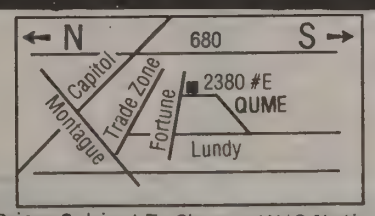

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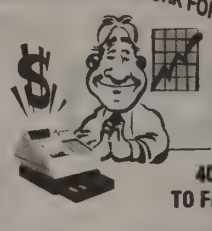
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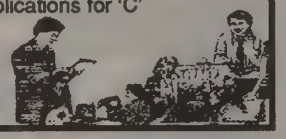

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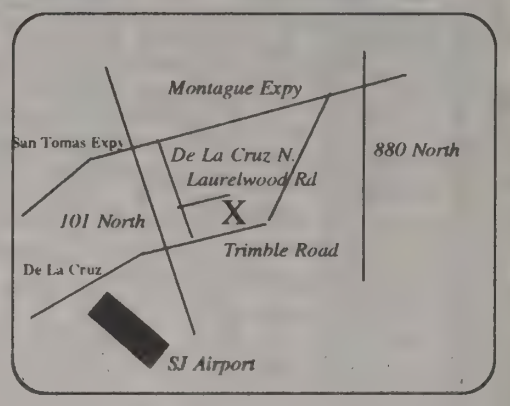

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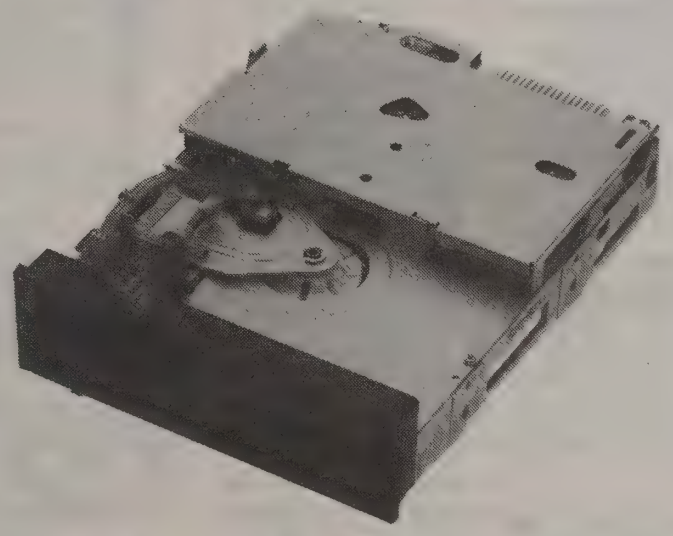

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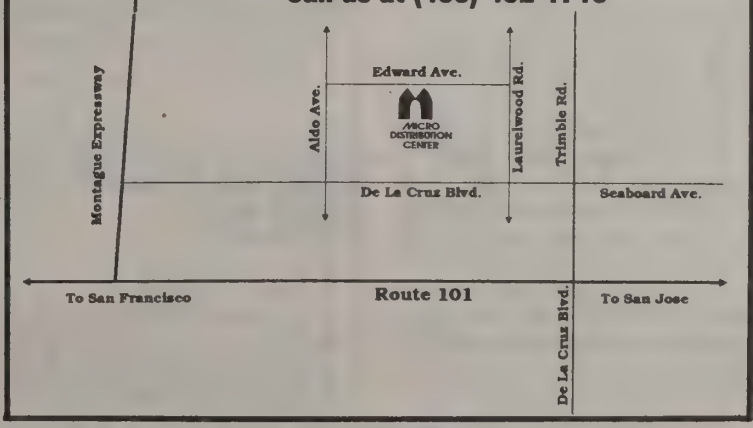

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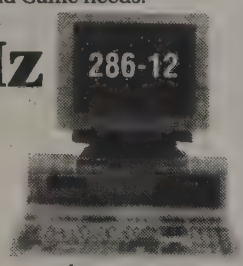

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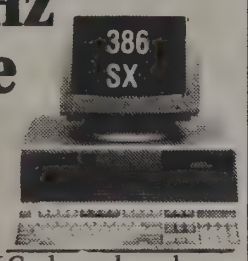

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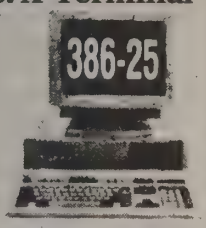

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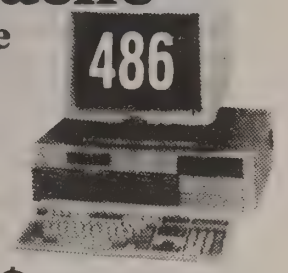

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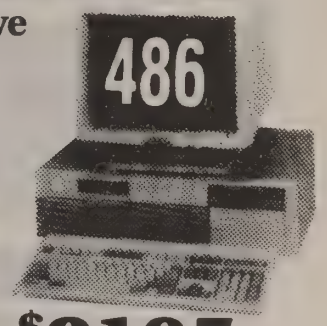

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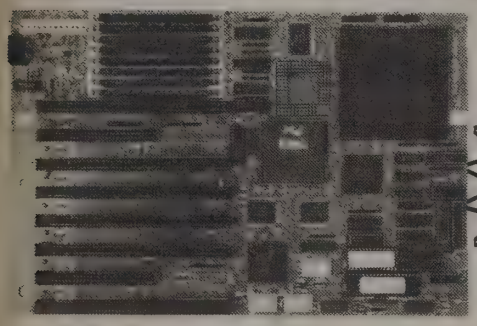

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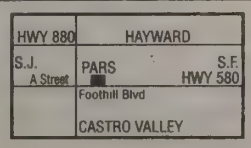

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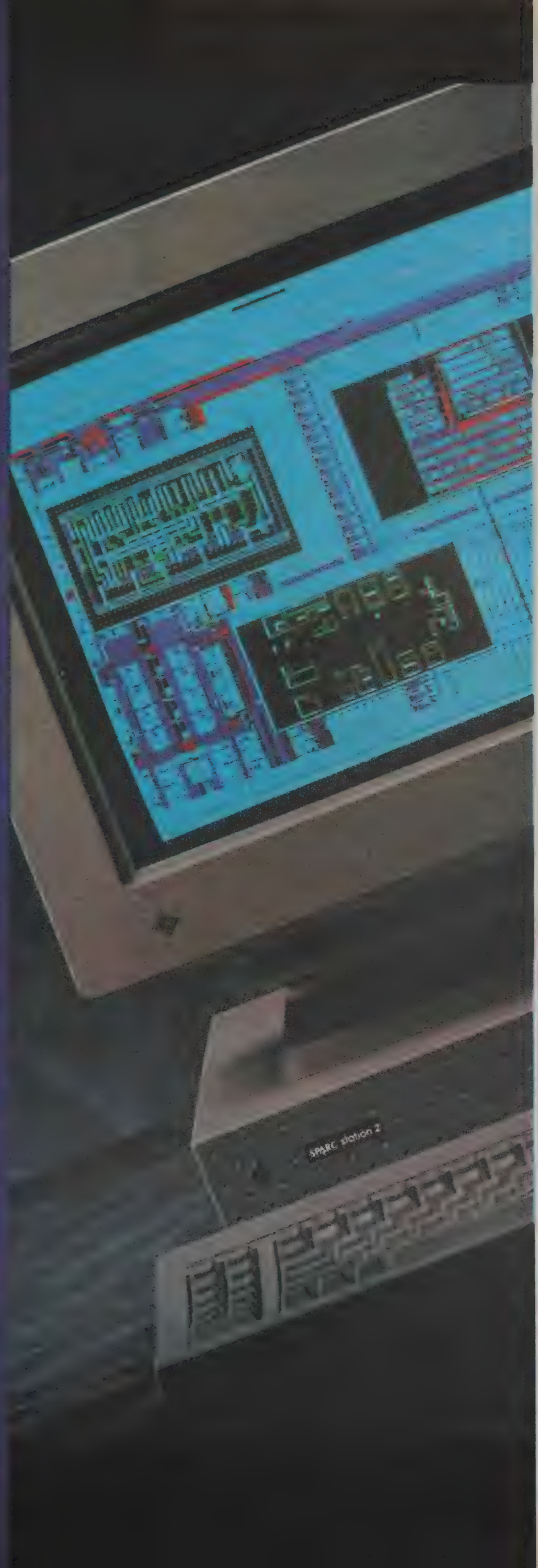

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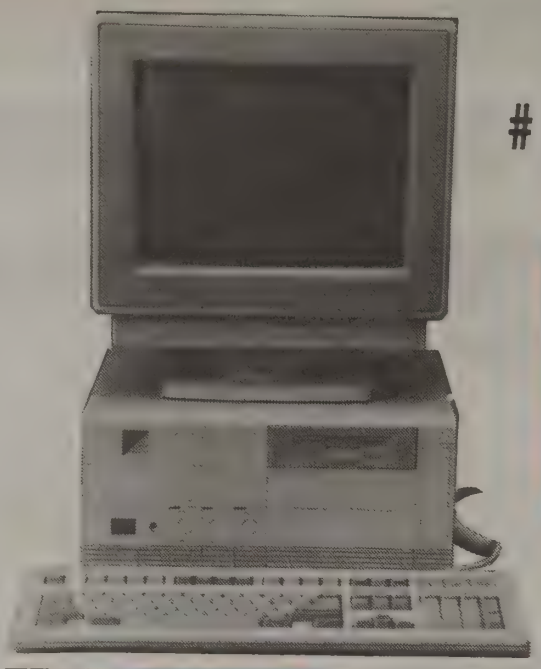

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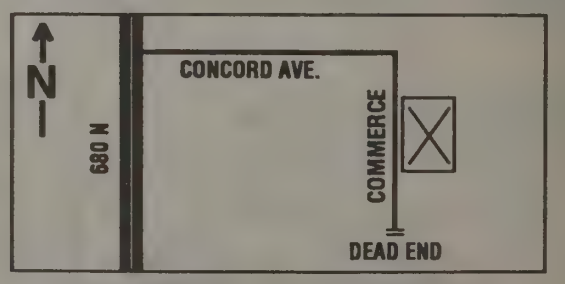

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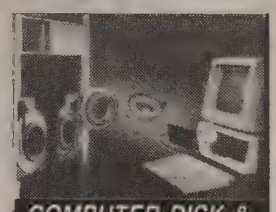

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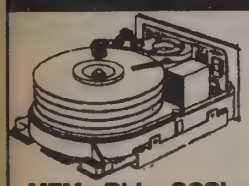

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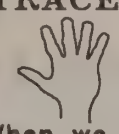

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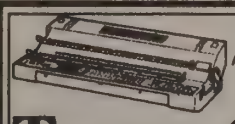

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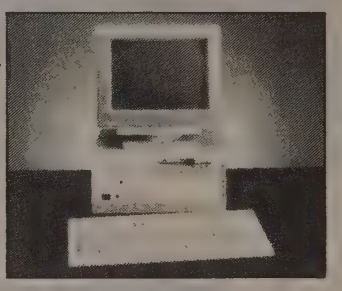

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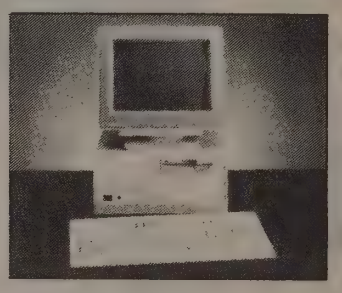

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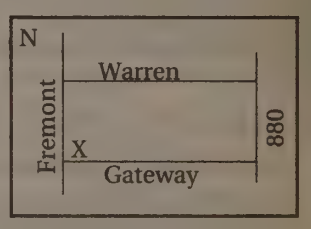

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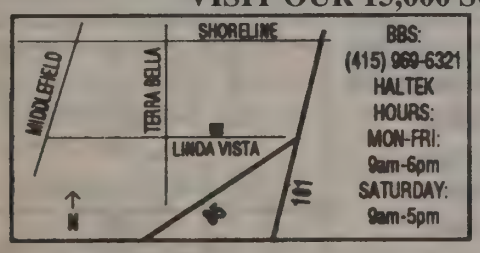

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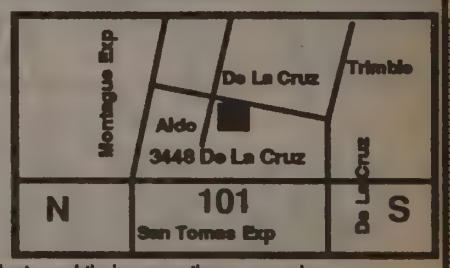

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Dvorak's Guide To Employment

Or Getting A Job In Tough Times

BY JOHN C. DVORAK

It's the time of the year when a lot of students have graduated from college. They are eager to jump into business as a high-paid executive, only to find jobs where they end up saying, "Would you like fries with your hamburger?"

I was watching *Good Morning America* the other day, and the theme was the tough job market. The host was interviewing three college grads who couldn't find work. All three had degrees in marketing or communications. There were two women and one fellow. Nobody could get to first base, hoping to jump from college right into VP of marketing from the sounds of it. I'm sure they'll end up either working for Apple as a name tag coordinator or in some hi-tech company selling hard drive add-ons.

Anyway, one of the girls—I'm having trouble using the word "women" with that duo—kept saying, "There are tons of stinnents (her pronunciation of the word "students") looking for jobs. There are tons of qualified people." Tons and tons and tons, ya know. As she chatted, bobbing her head back and forth in a bell-like motion, I imagined one of those truck scales out in front of the personnel office weighing in the legions. "Twenty tons so far today, Jim. And it's not even lunch time!"

DVORAK'S LAST COLUMN

I feel bad seeing these pathetic college grads, and imagine how stupid they must feel when they drive their dad's Cavalier into the parking lot at Northern Telecom, looking pert and collegiate, and go into the receptionist's foyer to discover that Julie Petrossian, last year's valedictorian, is the receptionist! Julie was also a marketing major. "Hi, Ann! Did you bring another copy of your resume? The one you sent in seems to have been burnt to ashes in a garbage can fire."

So, guilt-ridden, I'm obliged to help these recent grads find that job of their dreams—the one in the US software industry.

If any student uses these tips, and if these tips help, then all I ask is that I never get a phone call or ever hear from you. Never call, never write. Thanks.

© 1991 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

My tips are extreme and should only be used in emergencies. These tips work for both males and females.

1) Make an appointment for an interview. Send in the resume of Lee Iococca (get it from a *Who's Who* or a *Business Week* article and make up dates to match your age). Then wear black tights and paint your face like a mime. Wear a small pork pie hat and show up to the interview with one long-stemmed rose. Say nothing to anyone, just hand out a card which says your name and the comment, "I'm here to interview for the job of marketing director. Today I'm a mime. Tomorrow I'll be Pongo the jungle boy! Please be my friend. I love you."

This will cause quite a commotion and the boss will probably refuse to see you. Once the guards come to escort you to your car, act like a mime and pretend to be trapped in a glass box. After they finally throw you out, call your attorney and sue the company for breach of faith and discrimination. They'll either hire you for your creativity or pay off the nuisance suit for big dough.

2) Alternate technique #1. Have both ears and both nostrils pierced. Run a single piece of string through one ear in and out of the nose holes and out the other ear. The string ends should be long enough to each reach the floor. Wear an Army surplus green rubber rain suit and yellow hip boots with peace symbols painted on the toes in day-glo orange. Have your hair in Rastafarian dreadlocks and wear false eyelashes made of mink hair. On each cheek have someone write the words "Go Cougars!" Show up at the interview with a boom box and the Hank Ballard version of "The Twist!" When you arrive at the company, grab the string ends with each hand, turn on the music, and scream, "It's twisting time!" and start dancing while meowing like a cat at anyone who comes near.

When you are unceremoniously thrown out, quickly produce a document that you forged on your laser printer, indicating that you are required to dress and act like this for the job interview. Start to cry and tell them you're going to sue! The company will blame the whole thing on one of the practical jokers in the company and you'll be hired.

Say this: "Software has the same relationship to a computer that a dog has to a dog house. It's something you just don't worry about unless the dog is always barking! Right!?" Raise your eyebrows when you tell them that.

3) Alternate technique #2. This is for the person who actually wants to code for a living but doesn't know anything about coding. The idea is to get a job as a software designer and learn to code from the dweebs writing code for you.

Come in to the interview wearing an orange jump suit. When you shake hands with the personnel manager or whoever does the hiring say: "You know, you can't go to the bathroom in a suit like this. You have to take the whole damn thing off and sit naked in the stall. It's just like *bad software*!" This bit of philosophizing will always impress the rubes who do the hiring in software companies, since none of them knows exactly what software is or what it does. The idea is to exploit this ignorance with bogus but insightful-sounding dictums that put these people at ease with themselves.

Say this: "Software has the same relationship to a computer that a dog has to a dog house. It's something you just don't worry about unless the dog is always barking! Right!?" Raise your eyebrows when you tell them that.

Finally, drop a lot of names and indicate that these famous computer "experts" know little about software to put them in good company. "Bill Gates uses a double who knows something about software. He sure doesn't. We went to school together."

Just remember that the key to getting that perfect job is dependent on your own creativity. Good luck. ■

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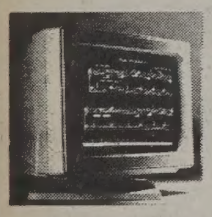

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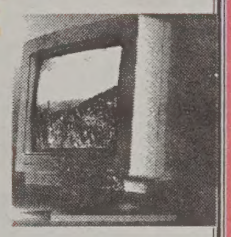

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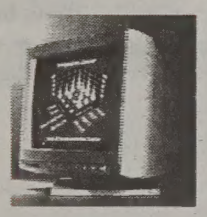

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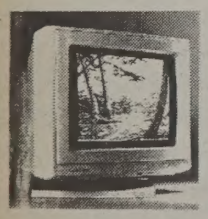

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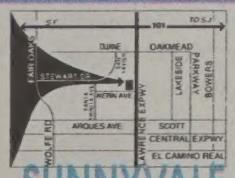

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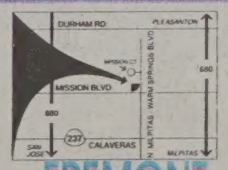

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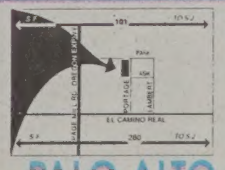

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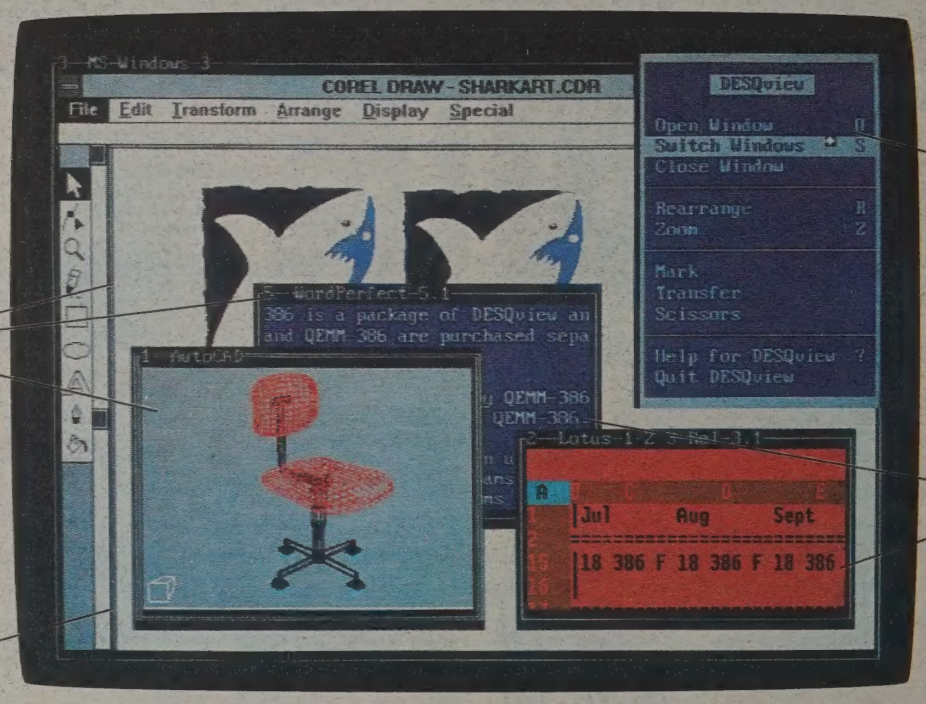

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